NATURE MAGAZINE

JUNE 1930 35¢ VOL. 15, NO. 6

Europe — in your pocket

Imagine a camera record of your European trip—with nothing missing—no gaps in your picture story. Here is a new way of doing it that writes off all chance of failure.

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A new camera—yes. But more than that: a new camera *habit*. For with this little pocket-size Ansco *Memo* you just snap, snap away at everything that interests you with confidence that you are going to get it.

Fifty pictures on a 50¢ roll—a penny a picture! *That's* the *Memo*. You can have hundreds and hundreds of pictures at a surprisingly low cost. Take three or four of each object, if you like. Take a series in quick succession—you can click off a *Memo* as fast as you can move your thumb.

And the *Memo* habit of just snapping away at anything that strikes your fancy will give you a wonderfully rich and diversified record of your trip. Also—a quick shot from the hip (you'll learn how to do it) will get lots of pictures where the use of an ordinary camera is difficult.

Travel with a *Memo* and get the views that others miss. Bring home a picture record of your trip that is pos-

shoot from the hip

sible with no other camera. Clean, sharp miniature prints for your album—for enlargements, any size you wish—for projecting on a screen (with the Ansco Memoscope).

MORE ABOUT THE MEMO · Loads in daylight. No focusing. No films to wind. No numbers to watch. Operates as fast as the thumb and finger can move. Takes 50 pictures from one loading. Developing and printing very inexpensive. Price including carrying case $20.

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AGFA ANSCO
of BINGHAMTON, N. Y.

June is the month of decisions. After looking over all the literature on where to vacation and what to do, the time has come for shutting one's eyes and sticking a pin through the map to determine one's destination. Let us hope, however, that some part of United States or Canada, preferably out where the mountains grow high and the open spaces are still open, will be the part pricked by the pin.

* * *

The Canadian Pacific Railway informs that an open-jaw tourist arrangement between Glacier Park, Banff and Lake Louise will be in effect this summer. This enables a traveler to take advantage of round trip rates on lines which run parallel to one another, the Canadian Pacific and Great Northern. The fare will be based on one half of the Glacier Park round trip fare plus one half the Banff-Lake Louise round trip fare, plus $27.75, which is the fare from Glacier Park to Banff, or $28.75, that from Glacier Park to Lake Louise. These fares are in effect only via the Soo-Canadian Pacific via Portal or Emerson and the Great Northern-Canadian Pacific via Winnipeg.

* * *

One of the most interesting organizations that have sprung up in connection with travel has been the Trail Riders of the Canadian Rockies, an association of outdoor lovers who promote the fellowship of saddle and camp mid the snow-clad peaks. Qualification consists of an established record of not less than fifty miles on horseback or on foot accompanied by a horse over trails in the Canadian Rockies. The president is J. M. Wardle of Banff, and J. M. Gibbon, Room 324, Windsor Station, Montreal serves as secretary. The booklet issued by the Association describes many of the interesting trips which can easily be taken on horseback through Yoho, Banff, Rocky Mountain and Kootenay Parks, and has many helpful hints for use on the trail.

* * *

An American organization promoting the beauties of the Canadian Rockies is the American Express Travel Department, whose "Lariat Trail" tours have become famous in recent years. These start from Chicago, travel to Lake Louise by way of Minneapolis, Moose Jaw, Medicine Hat and Calgary over the "Soo" line, motor through Rocky Mountain Park, Kootenay, Yoho and Banff Springs, and return to the States once more by rail. These tours, while not including much hiking, or riding, provide for six free days in which one may play around the peaks and valleys golfing, swimming, climbing or in the saddle. The trips are priced at $295 Chicago to Chicago, for one person with lower berth Pullman accommodations.

this Summer in
Glacier Park
"World's greatest dude ranch"

Do you know the thrill of luncheon on some high mountain-side, with miles and miles of pine forests spread out at your feet, and the keen breeze of six thousand feet ruffling your hair . . . with eternal snow a scant thousand feet above you?

Come and hike with us...up a winding trail through the clouds, to a meadow gay with wildflowers, where the air is always bracing, and the sunshine always bright!

Glacier Park — on the main line of the Great Northern — or perhaps you prefer the Puget Sound Country, where Mount Baker, wreathed in eternal snow, gazes at old Rainier. Then there's Alaska, or the Columbia River region, with high Mount Hood brooding over fat valleys...

Come and ride the trails with us this summer...hike, or fish, or play golf to your heart's content. Superb hotel accommodations, of course—and the finest vacation you've ever experienced.

New travel booklets, full of enticing pictures, rates, information, etc., from the Great Northern agent in your city, the local ticket agent, or direct from Great Northern Travel Headquarters at St. Paul.

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EMPIRE BUILDER
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Loveliest Garden of the WESTERN WORLD...

Awaits your Voyage of Discovery

PRIMEVAL gardenland where Nature's floriculture is the delight of every lover of flowers! Air that is languorous with blossom-born perfumes! Hours that idle by with the timelessness that is part of the soul of Hawaii!

More, this Pacific Paradise affords a world of opportunities for thrilling sport. Surfboard and sampan, canter and crater, tee and trail, divert the body while the mind takes its ease in Hawaii's glorious freedom from care.

For travel luxury as the globe-trotter knows it, and for a voyage that "ends all too soon," over the pleasant southern route, book LASSCO. With a well-balanced fleet, headed by the companion luxury liners "City of Los Angeles" and "City of Honolulu," LASSCO. With a well-balanced convenience in choice of sailing dates, and the widest selection of sumptuous accommodations.

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Jasper Park, the largest National Park in the world, is rapidly providing accommodations for the outdoor lover, much in the manner found so successful in Glacier National Park. This spring saw a reconditioning of all trails. The chalet at Maligne Lake is being enlarged, we understand, and tent-camps will be put in at Shovel Pass and in Tonquin Valley if the number of travelers warrants. Genial Fred Brewster, of Brewsters, Ltd. a firm of brothers who have lived through the days of opening up Canada's Rockies and played a prominent part in making them well known, is at Jasper, Alberta, to provide, within reasonable limits, any degree of accommodation for friends from the "States".

* * *

Grasshopper Glacier, concerning which W. C. Alden writes in the present issue, is one of the many phenomena of interest associated with the outskirts of Yellowstone Park, itself too well known to need boosting. The Thoroughfare Country, fringing the park at the southeast is another. This is a marvellously wild section, mostly over 8000 feet high, supporting one of the largest moose herds in America and an abundance of elk and furbearers. Here is an open space that will delight the most civilization-weary.

* * *

Many people, reading Arthur Newton Pack's southwestern adventures in this number, may wonder about the possibilities of their duplicating his trips. While years of training are necessary to develop knowledge of where to find the wild life and how to photograph it, yet no great deal of experience is required to enjoy the same scenery and the same type of leisurely travel. This department will be glad to furnish readers on request a copy of Mr. Pack's itinerary, and help plan a trip to the Southwest. Much of the American Nature Association Grand-Canyon-Bryce-Zion trip, as listed in "On Western Trails", will also cover this country thoroughly.

* * *

Billboardless Hawaii has other attractions besides the absence of "buy-ways", and June is the ideal month in which to visit it. (See Nature, June, 1929). Kilauea and other volcanic peaks have lately been acting up, and promise, with fair degree of assurance, displays for the visitor. All the islands are bedecked with their handsome summer garments, and the mountains, still in the exuberance of spring, are at the height of their beauty. The Los Angeles Steamship Company, and the Matson Line, with offices at San Francisco, have a number of tours to this land "that has all things."

* * *

If any senior in the larger Eastern colleges has not been to Europe, he is apt to discover, just now, that the conversational range leaves him quite out. Collegiate youth has gone Atlantic-wild during the past ten years. Third Class, once dedicated to the economically deficient, has been dressed up into Student Third, and non-collegians come down from First and Second Class to

A place to play

EVERYBODY plays at Chalfonte-Haddon Hall. The informality and friendliness are conducive to good spirits.

To children it is paradise. Sandy Cove is a room from a story book, a place of pure delight. . . . And they love to dine in the room where the big coral fish make solemn eyes from the wall-paper. . . . Perhaps children like Chalfonte-Haddon Hall so much because Chalfonte-Haddon Hall likes them and makes them feel at home.

Send the family down for a week or two. Let them rest in the sun. Ride on the beach. Breathe the tonic ocean air. Chalfonte-Haddon Hall makes cheeks pink and eyes clear and bright.

Write for information. There is a Motoramp garage.

American and European Plans

Chalfonte-Haddon Hall

ATLANTIC CITY

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enjoy the hilarity. Student tours through Europe are likewise very popular, and some institutions are giving summer school credits for them. Two of the leaders in the movement have been the Student Pleasure Tours, Inc., a subsidiary of the North German Lloyd lines, and the Student Travel Club, connected with Cunard and the Anchor system. Prices in both company's tours are reasonable; the service is excellent, and Europe is thoroughly, if rapidly seen. The neatest trick of the North German program, in our opinion, is the $545 trip to London, The Hague, Amsterdam, Brussels, Munich, Oberammergau, Dresden, Lucerne, Interlaken, and Paris, with sailings both ways on the speed-queen, the Europa, and motor trips through the Austrian Tyrol and the Alps. Cunard jaunt No. 7 to eight major continental countries likewise strikes the fancy. But there are no end of others. They all go to Oberammergau, too, this summer.

* * *

A division of travel in the Bureau of Foreign and Domestic Commerce, to help attract tourists to the United States, should be added to the Federal Government, Representative Dyer of Missouri recently told the House of Representatives. Canada and France, he said, lead this country in supporting the tourist trade, and though Canadians spent about $85,000,000 in the United States in 1929, Americans left more in the Dominion. The Division should make contacts with various types of travel agencies, be responsible for guiding parties of foreign business men through the country, maintain assistant trade commissioners for travel in leading foreign cities, and generally promote the interests of the nation. This worth-while suggestion should be thoroughly considered, since the tourist industry is rapidly becoming one of the most important in the world.

* * *

Sweden has recently abolished visas for Americans, probably in view of the international meetings to take place there this summer. A passport is required, however, except for the Sweden-born. This is another step, we hope, toward the utter abolition of the visa requirement. Already Belgium, Switzerland and Italy have done away with the visa, and in France, Denmark, Germany, Japan and several other important countries, it is issued gratis. It has proved to be mainly a waste of time and a cause for trouble. The United States has pending in Congress a bill which will permit the Secretary of State to renew the passport without charge. Formerly, though costing $10.00, it expired after two years. If legislation, obviously aimed at the immigrant but hitting the tourist, which creates the $8 head tax required of countries with which reciprocal agreements regarding visas and passports have not been negotiated, can be repealed, a great step forward to help tourists and the tourist business will have been taken. Americans travelling in Europe during the past ten years have had to pay as much as $100 in visas, and visitors from England and other countries with which we have no reciprocal arrangements have been similarly affected in the United States. The tourist business is too important to be held up by regulations that serve little or no purpose.

SOUTH AFRICA

South Africa is an enchanting travel land, and world famous also as a sunlit playground and invigorating health resort.

No other land can parallel the complex witchery of this tourists' paradise—its glittering background of gold and diamonds, its amazingly varied flora and fauna and its beautiful and majestic mountains and waterfalls set in their inspiring environment of natural grandeur.

Wonderfully fascinating, too, are the customs and ceremonies of the Bantus, and the ancient rock paintings of the almost vanished race of Bushmen.

The traveler will here enjoy all the luxuries of modern hotels and transportation, and yet have ample opportunity to drink deep of the primeval spirit of Africa, and to feel its dark mystery and brilliant romance.

Write for details regarding special cruise or independent tours. Ask for Booklet OD-2

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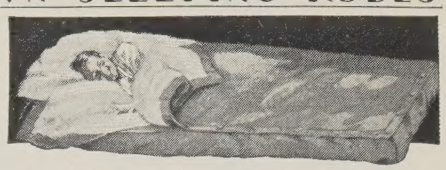

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MAKE your camp-fire anywhere, from the little Tennessee River's gap through the great Smoky Mountains to where the Athabasca comes out of the Rockies. When it's time to turn in you will be glad of the cozy warmth of your Woods Arctic Down Sleeping Robe. It insures you camp-fire comfort all night long without keeping up your fire.

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hooked on the first cast; by a wise amateur

—wise, because he does his fishing on advance tips of old scouts who know how, when and where to get the big ones. Scores of these skillful old timers and natives experienced in the tricks and familiar with the haunts of Canada's game fish, report to us regularly in season. Take advantage of this clearing house of tips on man-size bass, trout, "wall-eyes," muskies, pike.

Write or wire for full information. Mention the kind of fishing you like best. We'll tell you where to find it.
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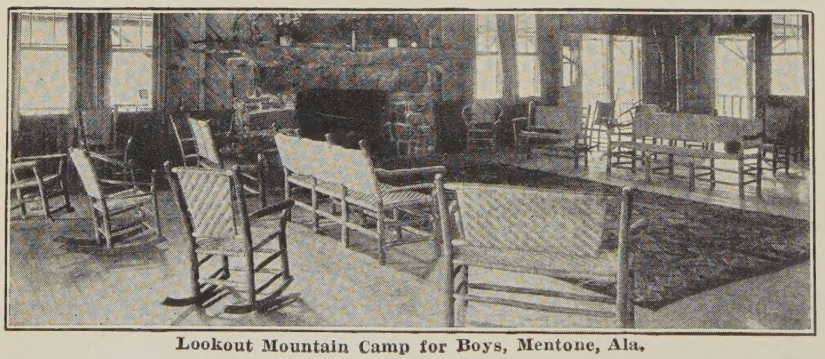
The Furniture Beautiful



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NATURE IN PRINT

On the Low-Veld

To us, least, there is always a fascination in the word "veld". It conjures up pictures of a far country to which we have always yearned to go—and will, some day. Hence we seized with pleasure *The Low-Veld, Its Wild Life and Its People* by Lieut. Col. J. Stevenson-Hamilton. The Low-Veld is that section of the Union of South Africa bounded by Southern Rhodesia, Portuguese East Africa, Swaziland and Transvaal Province. It is a land rich in flora and fauna and in history. The animals in the zoo which most interest us are the lovely horned mammals of South Africa, zebras and other forms of different and exotic character from that part of the world. Now comes Colonel Stevenson and makes us ache to be away and discover whether we cannot see and, perhaps, photograph a giraffe in its native haunts. To all who may have a similar urge we recommend this book, which is published by Cassell and Company, London, and Toronto.

Chief Pokagon

Chief Pokagon, friend of the white man, and recorder of Pottawattamie legends, wrote no more beautiful tale than the Pottawattamie Book of Genesis, which describes the Indian story of the beginning of things. C. H. Engle, a publisher at Hartford, Michigan, has had this little legend reprinted on birch bark, making a very attractive souvenir.

Biological Survey

No other organization of government so closely deals with Nature as the Bureau of Biological Survey, and Nature lovers and conservationists everywhere will be interested in the carefully prepared history issued by the Brookings Institution from the John Hopkins Press. Jenks Cameron is the author, and he has compiled as thorough a report as his previous monograph on the Development of Forest Control in the United States. The book is priced at $2.00.

Back on the Farm

Among the spring books, *Old Doc Lemmon* will probably do more than any other to recreate days spent on the farm. It is a rambling, unpretentious monologue told by an old country "hoss-doctor" whose years have been close to the earth, and set down by the chronicler, Robert S. Lemmon, who is able to catch the pith of the philosophic observations in very presentable dialect. It is filled with the calmness, solidness and peace agricultural lands, especially if they bring a fair living, always create in the people dwelling on them. It is published by the Midwest Company, Minneapolis, at $2.

Along the Shore

It was along the marges of the ancient seas, when the world was young, that life began. Between the reaches of the flood and ebb tides, the earliest forms of plants and animals were born, later to adventure either in the deeper waters off the shore, or up on dry land, above the ocean's swell. And today, many of the primitive types still exist in the shallows near the land, to furnish evidence of the vital history of living things. Some of these have engaged the pen of Eva L. Butler in her recent book, *Along the Shore*, published by The John Day Company, New York, at $1.25. In the neat pages, one will find the sea urchins, the sand dollars, the various members of the crab family and the sea anemones living as harmoniously in print as they do along the sands. Miss Butler has illustrated her writing with many drawings, and gives directions for collections and the preparation of aquariums. The book is in handbook size, and makes a useful accompaniment to a seashore trip.

Wealth of the Sea

The economics of the sea are filled with romance and adventure. The picturesque whalers, the courageous pearl-divers, the interesting oyster fishermen and untutored South American sea-salt manufacturers, the grizzled Gloucester fishermen—all the types of humans that reap the harvest of the deep for others to enjoy have a quality of glamor mere landlubbers do not possess. *The Wealth of the Sea*, by Donald K. Tressler, just come from the Century Co. press, has much to do with these people, and with the manifold products of the five oceans. It is a well written compendium of information on all the industries based upon oceanic animal or plant life, and besides being a valuable reference book, it is well worth reading to gain an understanding of the important part salt water, covering 70 per cent of the globe, plays in our lives.

Newell's Animals

David Newell is at once the author and the illustrator of an interesting little book of verse entitled *American Animals*. In simple poetry he presents the outstanding facts about the life habits of our mammals. Each poem is illustrated with line drawings of the subjects and there is further illustration in the way of four-color plates to the number of ten. The publishers are the P. F. Volland Company of Joliet, Illinois. The blurb does not reveal the price of the book. (Soon we will start on our one-man campaign to compel publishers to print the retail price of their books together with their complete addresses in some permanent part of the volume.) Albeit, Mr. Newell's book is an attractive little volume, whatever the price.

Indian Corn

The latest addition to the excellent and interesting leaflets brought out by the Field Museum of Natural History, Chicago, is one entitled *Indian Corn*, written by James R. McNair, assistant curator of Economic Botany. The booklet discusses its origin, geographical distribution and varieties; its uses by the American Indian, and modern industrial and experimental products. It costs 25 cents.

RICHARD K. WOOD

WILD-LIFE photographer, writer and sportsman, Mr. Richard K. Wood, who took this thrilling wild-life picture, has roamed the length and breadth of the continent armed with a Graflex, his favorite camera. He has braved the elements in the Northland when the thermometer hovered around 40° below zero, sweltered in Florida palmetto jungles while waiting for rare blue herons.

In Physical Culture Magazine Mr. Wood tells how his Graflex "made a new man of him," kept him out of doors and transformed him from an ailing, weak youth into a hardy and healthy man of the open. He has not needed the services of a physician for the past ten years. Graflex has brought him a remunerative hobby—and it has brought him health.

For subjects that are hard to get—always take along a Graflex Camera!

Graflex pictures *live!* And the unique construction of the camera itself makes the most difficult subjects surer... simpler... for amateur and professional alike.

The CAMERA For More *Interesting* Pictures

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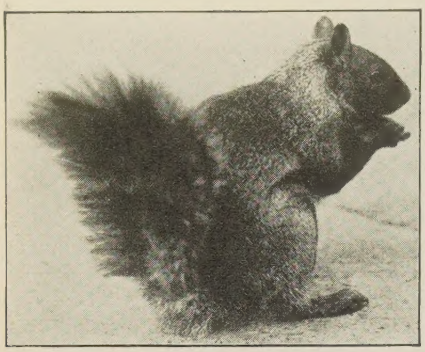
I want to see the booklet that tells how more interesting pictures are being made. Please send "Why a Graflex?" to name and address written on margin of this page.

At close range



with FILMO

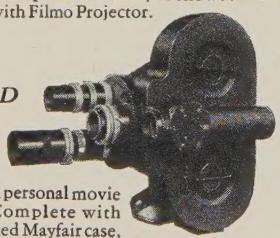
If your eyes were 6-power telescopes, you'd still be far behind Filmo in catching nature subjects at close range . . . for in Filmo movies you have a permanent close-range action record which can be viewed again and again.

Filmo 70-D has a three-lens turret and seven film speeds. You can switch from a speed lens to a telephoto lens in a split second or you can catch a squirrel's leap in S-L-O-W motion. Filmo's simple operation leaves your attention wholly free for hunting down your prey.

At good dealers everywhere, or write today for literature.

All Filmos use 50 or 100 foot films. For black and white pictures, Filmo cameras use Eastman Safety Film (16mm.) in the yellow box—both regular and panchromatic—obtainable at practically all dealers handling cameras and supplies. Filmo cameras and Filmo projectors are adaptable, under license from Eastman Kodak Company, for use of Kodacolor film for home movies in full color. Cost of film covers developing and return postage, within the country where processed ready to show at home or anywhere with Filmo Projector.

Filmo 70-D



"Master of all personal movie cameras." Complete with Sesamee-locked Mayfair case, $245 and up. Other Filmos from $120 up.

BELL & HOWELL

Filmo

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INTEREST in colored film has grown tremendously during the past few years, and while several excellent color systems, notably the one put on the market by Eastman, are on the market, many people who cannot avail themselves of these may do their own coloring at little expense and with much enjoyment. With a little practice, several feet of film can be colored in a few minutes. The positive, not the negative, of course, receives the treatment.

"In order to facilitate the work," says *American Photography*, "the ciné colorist should build a long coloring box, 30 inches long, six inches deep, and six inches wide. The interior of the box should be illuminated by two mazda lamps—25 watt lamps are sufficient—below which may be placed a glass mirror. The top of the box is covered with a sheet of ground glass. As the film passes over this glass top, it is well to have some means of keeping the film in place, in a straight line. Two strips of wood can be used for this purpose, which are separated so that the film can slide easily between them. The edges of the strips should be taped so that the film does not get scratched in passing. This box will serve to illuminate the section of film being colored, and forms a convenient stand upon which to work with the brush.

"The materials needed are few and inexpensive. A good assortment of water colors, slabs, wells, and brushes being practically all that is needed. Red sable and Jap-Art brushes are recommended. In the sable brushes, a one-eighth and one-quarter inch, each with flat, chisel edges will be found most useful. In the Jap-Art brushes, the popular L-1, D-1, D-3, and N-1 are fine for detail work, while the sables are used for larger areas, such as sky and water.

"To begin with, about five colors should be prepared. It is important that enough color be mixed to complete the film. The usual procedure is naturally to color the film, one color at a time, throughout the length to be colored. Each time a new color is used, the brush should be rinsed in clean water. This is important. The degree of depth must be decided by the colorist, but it must not be forgotten that in coloring lantern-slides and ciné film, the color must be deeper than usual, because, on projection, the colors appear lighter. Colors prepared especially for this work will not block out others, and where two colors meet, there is no running in."

Such colors may even be superimposed without danger. The brush must, under no circumstances, be overloaded, for this will often blotch and spoil the film. The emulsion side of the film receives the color, and the film should be kept as clean as possible. If the film repels the color, sponge over it with a soft sponge moistened with a weak solution of sizing. If the work is faulty, the paint may, of course, be washed off, and the work done over. Many rainy afternoons can be spent enjoyably with such work, and the results will be a matter of much satisfaction to the worker.

FORESTS AND MANKIND

By
CHARLES LATHROP PACK
President of the American Tree Association

AND

TOM GILL
Forester

250 PAGES

64 ILLUSTRATIONS

. . . a book to read and to read time and time again by those who seek knowledge of the importance of the forests in their historical, social and economic relations to mankind.

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Order from
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WASHINGTON, D. C.

The Eastman Research Laboratories has helped answer a query recently made to this department regarding the preservation of Ciné-Kodak film. The film, we are told, will undoubtedly stand up for many years, just as the first Eastman Motion Picture Film, which is still in a good state of preservation, has done. Pictures of President Roosevelt, taken at the time of the Peace Conference at Portsmouth, N. H., which ended the Russo-Japanese war, are still in fine shape, and the same care used in making these films has been put into Ciné-Kodak. The best way to preserve the film, however, is to have a duplicate copy made before the original has been projected often enough to become scratched. This duplicate is for general use, and the original may be stored in a safety deposit vault or in a Kodascope Humidor, to be taken out only twice a year for examination on a rewind or for making duplicates. When film becomes brittle, moistening the pad in the humidor with water will correct the condition.

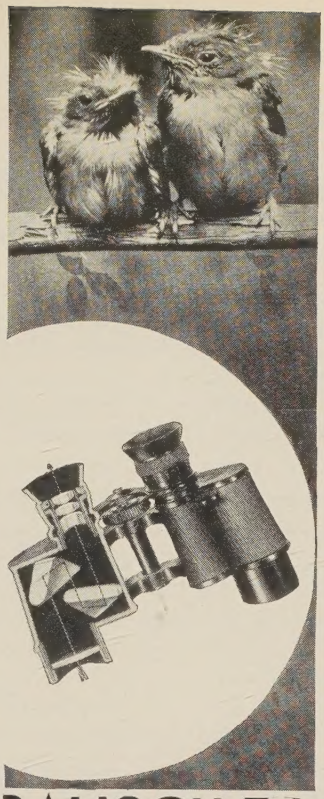
* * *

A new amateur movie camera with visual focussing finder has recently been put in the market by Victor Animatograph Company. This is Model 5 Victor Ciné-Camera, a three-lens turret instrument, the lens in which may be turned to the finder position, thus enabling the photographer actually to observe an image which corresponds in size and focus with the one that will be exposed. Each scene may be individually focussed without attention to the focussing ring, except to produce finally the sharpest possible focus. This feature renders the use of fast lenses more practical, and insures absolute accuracy in securing even close-ups.

* * *

The Victor Company have also compiled a directory of 16 mm. film sources, which they are supplying free on request directed to Film Directory Editor, Victor Animatograph Company, Davenport, Iowa. A tabular style of listing also helps to show the kinds of films available from any one place, and reels are designated as being appropriate for school, church, professional or entertainment use.

BEGINNING with our July issue a new Photographic Department, edited by an authority and illustrated, will be offered to our readers. This department will be given full page space and we trust that it will be of service and that our photographic readers will avail themselves of its special services.



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THE AMERICAN NATURE ASSOCIATION

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THE MAGAZINE

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THE POTOMAC AND POWER

An Editorial

Power, legitimate in its sphere, has once more set itself at cross-purposes to the wishes of the People.

The struggle now is over the historic and beautiful shores of the Potomac River from Mt. Vernon, Washington's famous home, to Great Falls, the Capital's greatest scenic asset. The people, expressing their wishes in the Cramton-Capper Bill, which has now passed the House and been reported out of committee in the Senate, want this area as a public-owned parkway, to preserve the beautiful gorge of the Potomac, the scenery and wild life along the twenty mile stretch.

The Potomac Power Company, controlled by the Byllesby interests, wishes to defeat the bill. Their eyes are on the 3,000,000 kilowatt-hours of power per annum which the river might develop. They cannot, at present at least, get a permit to build dams below and above Great Falls should the measure be made law.

Even though amendment to the Parkway Bill specifically provides that acquisition of land for park purposes shall not debar its use for the development of hydro-electric power when Congress deems it necessary, they still are trying to prevent its passage. They feel—and rightly—that once the public has learned to appreciate fully its heritage of beauty embraced by the shores of the Potomac, none can exploit that heritage.

The plans for the parkway, as developed by the National Capital Park and Planning Commission, include the beautification and preservation of both shores of the Potomac, and the establishment of a highway closely following the river from Washington's home to above the Falls. The lower part of the river is lakelike. The shores on both the Maryland and Virginia sides rise gradually into beautiful farm and meadow land. But farther up, just above Georgetown, the river narrows. Rocks appear in the stream bed; the shores rise precipitously in cliff-like palisades; rapids foam noisily. At Little Falls, a visitor can more easily imagine himself in western mountain country than in the midst of calm eastern farmlands. The climax to the crescendo of wildness is reached at Great Falls, where the Potomac divides in two main streams, and boils and tumbles down a forty-foot drop—one of the most beautiful falls in the East.

The rocky contour of both shores, the deep glens, steep banks and cliffs that adjoin the Potomac are utterly different, scenically, from any other spots along the Atlantic borderland. Historically, they are priceless. Along the Maryland side sluggishly flows the Chesapeake and Ohio Canal, picturesque for its lockhouses and its memories. On Virginia's shore are the remnants of the Potowmack Canal, blasted out under directions by George Washington. Near Great Falls are the sites of the First President's foundry and the massive locks of his first canal. Civil War and War of 1812 history was made here. The Bill will preserve these spots.

Washington is soon to spend $300,000,000 on beautification. The same measure authorizing the parkway contains provisions for an outlay of $16,000,000 additional to supplement the park system of the District of Columbia. The goal is the creation of the City Beautiful, worthy to be the Capital of a Nation endowed with more natural beauty than any other country in the world. The Cramton-Capper Bill provides the setting, which is as necessary as the jewel itself.

The power people offer many promises in return for defeat of the proposed law and the issuance of a power permit. For instance, they will supply a park of their own, and assure at least 500 second-feet of flow over Great Falls. They will construct their buildings in keeping with the surroundings, construct two free bridges across the Potomac, and prepare part of the river for ultimate canalization to the Ohio.

Even if kept, however, these promises would not give the public what it desires. The best display at Great Falls takes place when 7,000 second-feet go over the rocks. The two lakes extending over 24,600 acres will cover many of the interesting glens, rock formations, and species of plant life. They will be but artificial bodies of water destroying the naturalness of the scenery and the beauty of the gorges of the Potomac.

And is power necessary? It has never been shown that the district in reach of Potomac River power is now handicapped for lack of it. It has never been conclusively proved that the present rate of rapid increase of real estate values around Washington will not more than equal the savings supposed to accrue from power development. The Government, by buying the parkway lands now, as provided in the bill, will make a shrewd buy.

The intangible values—and they are the important ones—are on the side of the Cramton-Capper Bill. They involve the millions who yearly flock to Washington. They involve the pride of the Federal Government, which has never made a practice of sacrificing a single aspect of the beauty of its surroundings for mythical savings.

The rights of developing power still remain in the hands of the people, where it belongs. Now they want beautification and preservation.

Pass the Cramton-Capper Bill. That is what the people want!

GAYLE PICKWELL

ON HIS HEAD AND SHOULDERS
IS THE GOLDEN MANTLE

No lovelier bit of animation inhabits the western mountains than this charming ground squirrel

NATURE MAGAZINE

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June
1930

HAROLD A. BULGER

LIKE A FULLY-DEVELOPED CASE OF MUMPS
Ground squirrel photographed at Going-to-the-Sun Chalet by a member of one of the Nature Magazine Glacier Park parties

SOME FOREST SPRITES

Varieties of Western Chipmunks Mean Much to the Outdoors

by Gayle Pickwell

AT THIS season the outdoors lures us and all who can yield willingly to its gentle call. Many eastern eyes are turned to the great wild playgrounds of the West; the mountain trails and camps, the birds and mammals and flowers that there abound. And there is one fellow—really a group of fellows—we meet there who is full of charm and fascination and friendliness. It is the bright-eyed, whisking chipmunk. It makes us feel welcome and at home.

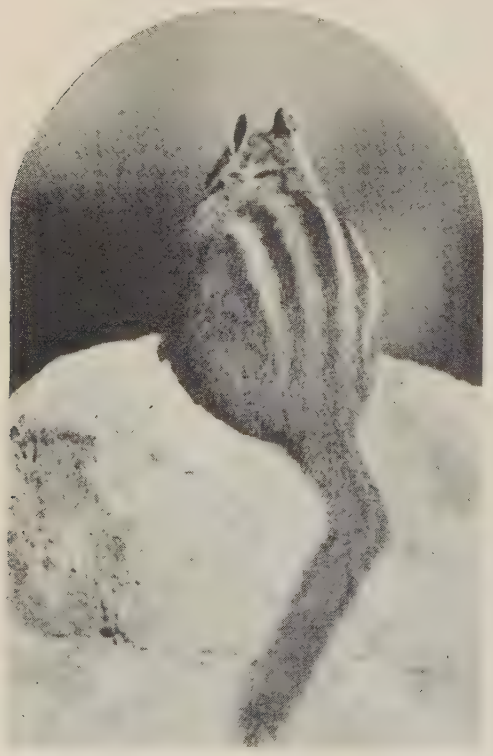
In boyhood days in eastern Nebraska the nearest approach to chipmunks was that odd little tremolo whistler of the prairies, the thirteen-striped spermophile, or its larger all-gray cousin, the Franklin ground squirrel. In the forests of northern Illinois I first made the acquaintance of the eastern chipmunk when, trying to locate a bird with a new note, I came across the maker of the note, a little furry wood sprite on an old log vociferously protesting my intrusion with birdy squeaks and twitching tail. In the hills of New York I met him again and I learned to look forward to the animation the busybody contributed to every bit of woodland scenery. But though the chipmunk comes to be a part of the forests and copses of the East and is one of the best known bits of life there, it is in the far West that chipmunks have made their greatest developments.

One who crosses the great sage-brush plains glimpses the little striped ground squirrel who, with stubby, whitish tail thrown up over its back, goes loping off in alarm into the brushy cover This little fellow, called antelope chipmunk, seems desperately afraid for his life. He is

H. H. PITTMAN

wisely so because the great exposed spaces show his movements so clearly to soaring hawks and prowling coyotes. From the plains you come to the wooded mountains of the West—Rockies, Sierra Nevada or Cascades —and there you find other chipmunks. These, better protected by rocks, undergrowth and trees, show less terror of the world in which they live. After the first chattering announcement with which they greet your arrival they will come to investigate for, where humans tarry, food crumbs seem always to be spilled.

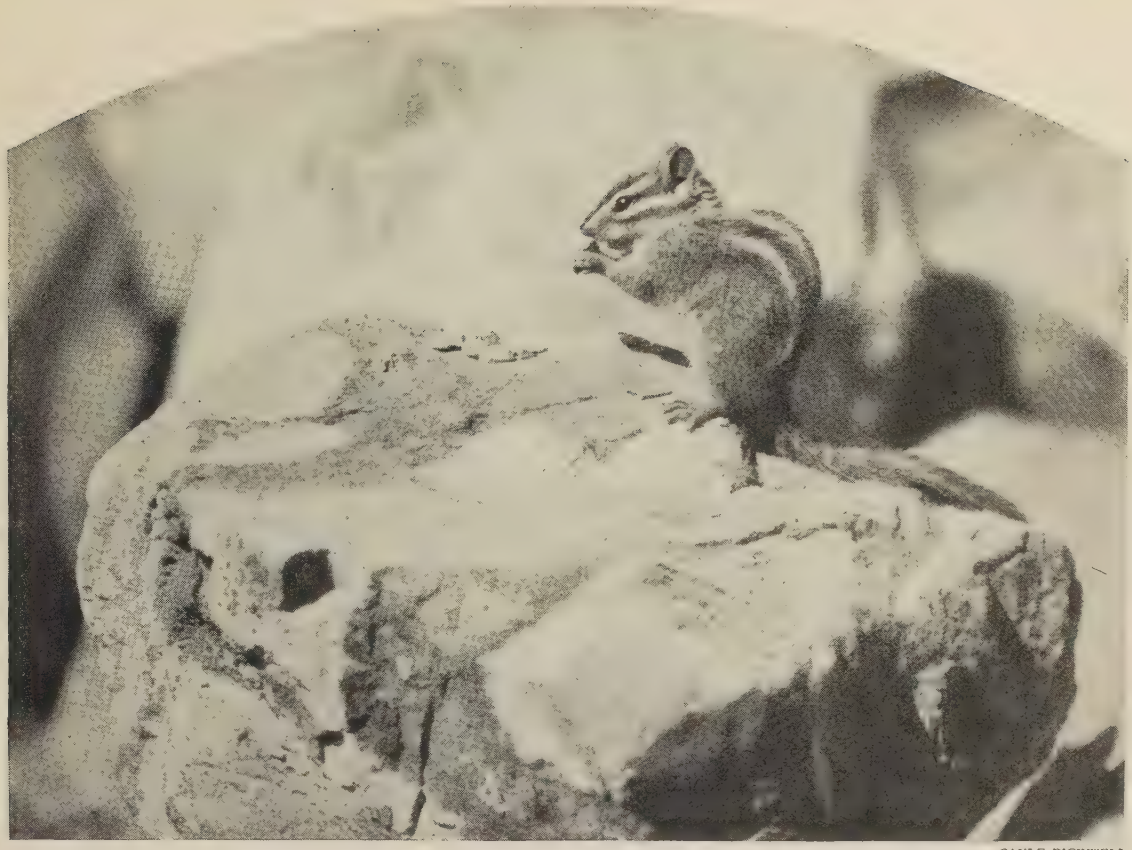
With chipmunks, as with so many other animals—not even excepting the birds—the conditions of the West seem to have made possible or necessary many different species and varieties. The rugged mountain ranges, the great deserts intervening, the regions of heavy rainfall, the regions of slight rainfall have erected barriers that chipmunks could not cross nor leave. So there have developed almost as many species and varieties of these perky fellows as there are differences of environment.



FRANKLIN GROUND SQUIRREL OF THE PLAINS AT THE TOP

At the left is the Olympic chipmunk like a little furry zebra with the stripes running the wrong way, while at the right the Columbian ground squirrel investigates the possibilities of provender

PICKWELL A. N. PACK



GAYLE PICKWELL

Once there had appeared a type of chipmunk best suited to escape its enemies, perhaps it perpetuated its kind and others have fallen by the wayside. There is something more than coincidence in the fact that in the heavy, damp, dark forests of the Northwest the chipmunks are large and dark and, in the desert and open spaces of the Southwest they are slight in build and light in color. Thus it comes about that where the slightly varying conditions of the eastern United States have made possible but one species and five varieties of true chipmunks, in the West the equivalent group has fifteen species and no less than fifty-five varieties!

In addition to the many true chipmunks of the West there are several ground squirrels with stripes, colors, notes and actions that, in most respects, make them as much chipmunks as those with which they associate. Indeed, such a fellow as the golden-mantled ground squirrel is marked more like the eastern chipmunk than is the one correctly called chipmunk in the West. Thus, with

ABOVE, THE WESTERN CHIPMUNK TRIES MACARONI

At the left the golden mantled ground squirrel throws discretion to the winds at the call of food, while at the right another sits at his meal for all the world like a paunchy old fellow on a stool

A. N. PACK PICKWELL

the many true chipmunks with their nine lengthwise stripes and the many chipmunk-like ground squirrels of the forests with their six long stripes, these woodland creatures become numerous. Also they are somewhat trying when it comes to naming them successfully.

However, no matter how they may differ from the chipmunks of another state or mountain range, the names to be learned in any one locality are only two or three in number. So we come quickly to find that the handsome but paunchy fellow of the mountains of Oregon and Washington is the golden-mantled ground squirrel and the natives call it "big chipmunk". It carries on either side two black stripes enclosing a white, and there is a tawny yellow suffusion over its face and shoulders that stands out in striking contrast to the dark brown of the rest of the body. The smaller, far more alert and cautious squeaker is one of the true western chipmunks, the Olympic variety, which the natives call by the obvious title of "little chipmunk". It has five longitudinal dark brown stripes enclosing four white or gray stripes all of which make it like a little, bushy-tailed zebra with the marks running the wrong way. On Mount Rainier we make the acquaintance of another western chipmunk, a larger, more aristocratic relative of the little fellow. This one, called the Cooper chipmunk, has the nine stripes but the whites are grayer, and the total size noticeably larger.

GAYLE PICKWELL

A GOLDEN-MANTLED IN FULL PROFILE

The natives know this chap as the "big Chipmunk" with his six stripes of a ground squirrel

What a pleasure are these striped fellows! Near Crater Lake we camped beside a snow drift in late June but the morning sun had scarcely thawed our cramped muscles before the chipmunks came to make overtures at friendliness with sprightly appeals for crumbs. We succumbed to the appeal and laid out bread crumbs in little piles. To these the mantled ground squirrels, the "big chipmunks", came first, in confidence that their chubby selves and lovely costumes would meet no harm. Somewhat later the western chipmunks, the little ones, looking slender with their length-wise stripings, speaking agility with their twinkling feet, overcame their greater caution in order to fill cheek pouches with campers' alms.

What a store a cheek pouch holds! Sitting on their hind legs, hunched over, these chipmunks held their bread chunks in fore paws the while they nibbled off particles with feverish hurry seemingly stuffing the pouches with rapid tampings of the nimble tongue. The mantled ground squirrel filled them so full that the cheeks protruded on either side like those of the lumbermen of this region when they have taken a heavy, double cud of plug.

With pouches filled to capacity the chipmunk takes himself off with business-like speed to some storehouse beneath root tangle, rock pile or under ground. A few minutes elapse while the burden is disgorged and back he comes for another double chew. So business-like is he that, no matter how high the bread-crumb pile is in the beginning, trips will be made so regularly, methodically and rapidly that all will soon be removed. Having exhausted us of extra bread the mantled ground squirrel investigated a frying pan and licked with pleasure the tasty bacon flavor there.

Where campers camp chipmunks learn to investigate every tent site. So sure are they of favor that the big fellows will shortly learn to take offerings from your fingers. Lacking humans to aid them, they work assiduously all day gathering seeds, berries and buds. On Rainier we frequently saw the western chipmunk twenty or more feet in the firs and far out on the limbs searching, apparently, for tender terminal buds.

The western chipmunks are features of the mountains. While the "little chipmunk" will occur well down to the base of the ranges if trees are there he will also make a home in the rock slides above the last of the trees where the marmot whistles and the cony bleats. The mantled ground squirrel likes more open spaces.

We know now, since Eliot Howard wrote his famous book, "Territory in Bird Life", that birds sing not so much to please a mate as to proclaim to the world of other birds that they have staked a claim and others are to stay off. Perhaps it was this urge or instinct that caused a "big chipmunk" to climb a rock beside our tent on Rainier's northeast side, there to stand upright and call his chirping call regularly for many minutes every morning. We suspected that his family was in a rock pile near and this morning tocsin warned other chipmunks of preëmpted claims.

Chipmunks, like most true squirrels and unlike the majority of mammals, dislike the dark and work in daylight only. Indeed the sun is so important in their economy that they lack much of their sprightliness on cool or cloudy days. For the lover of the woods, the walker on the trails, this is well, for without chirp and chatter, the shining eye and flash of color that these nymphs contribute, the western out-of-doors would be heavy losers.

ON THE GRAND CANYON TRAIL

Following the Bright Angel Trail in the Grand Canyon as it winds its way downward through ages of rock formation

From RIM *to* RIM

Camera Hunting in the Land of the Grand Canyon

by Arthur Newton Pack

Photographs by William L. Finley and the Author

WE HAD come from "The Land that Never Was"—from a wilderness of mesa, desert and arroyo; where only rarely has man ventured to live in scattered adobe huts; where roads are mostly ruts across the face of the waste. We had fought washouts, mud and shifting sands. We had dug our way from the beds of swollen creeks. We had climbed to the homes of an ancient and forgotten race at Mesa Verde. We had followed the trail of the rainbow to the very rainbow itself—the graceful arch of Rainbow Bridge. We had struggled through the Navajo country, on occasion talking volubly in sign language. The days since we had turned our cars toward the distant peaks of the Sangre de Cristo Mountains had been filled with adventure, toil and the joy of conquering a "land that never was"; a land filled with many fantasies that Nature, during ages of play, had contrived to rear on the face of the earth.

We were going toward another land where Nature had thrown her mighty and persistent forces to carve canyons and wash away mountains. Our way led along the Navahopi Road from the Indian country of the Painted Desert, the most fascinating and picturesque of all of the approaches to the Grand Canyon of the Colorado. From Cameron, on the Little Colorado, a narrow, twisting road wound up and up beside rocky canyons, through the petrified remains of forests of long ago. Now and again the mixed flocks of sheep and goats of the Navajos gave us grudging right of way as the highway tied and untied its own knots. Our car labored up a steep grade while we looked back at the pink and gold tapestry of the Painted Desert.

Then our road turned into a splendid boulevard and we were riding along the rim of the Grand Canyon which lay beside us, blue and mystic in awful depth and distance. Yet this first glimpse was understandable, alluring. One could grasp it, where later the whole panorama of the Canyon itself seemed beyond human comprehension, so mighty and complex is its grandeur.

THIS is the first of two articles by Mr. Pack based on camera hunting in the region of the Grand Canyon, Bryce and Zion National Parks. The region covered by the expedition is in many ways identical with that covered by the Southwestern Trip organized for members of the American Nature Association and their friends for the coming summer and described in the booklet "On Western Trails". This limited party will leave Chicago on August 23 for a remarkably complete trip over the Indian Detour and through the Grand Canyon, Bryce and Zion Parks. It offers a remarkably fine late summer vacation at an ideal time of year to visit this region.

WE HAD COME FROM THE INDIAN COUNTRY

There we had photographed them at their tribal dance

AND WE HAD MET THE TRIBAL CHIEFS

As well as youthful members with heavy responsibilities

Night found us at El Tovar, planning our cross-canyon trip of the next day, and, as we arranged for mules and pack animals for our cameras and equipment, who should appear but Vernon Bailey, Chief Field Naturalist of the U. S. Biological Survey, and his wife, Florence Merriam Bailey, noted naturalist as well as an authority on the birds of the Southwest. With them was Park Naturalist McKee, and we all agreed to meet later in the Canyon below.

By one the next day we were aboard our sturdy, trail-wise Missouri mules and off down the Bright Angel Trail, looking forward to photographing antelope on the Tonto Plateau, half way down. This trail has a reputation for steepness and thrills, and many tourists tell of the propensities of the mules for selecting the outside of the trail there to nibble at a stray flower. Truthfully, however, the mule is more sure-footed than the human, trained as he is to these trails, and he cherishes no more desire than does his rider to go hurtling through space a thousand feet or so.

Upon the Canyon wall as we pass is written the story of the world. Through thousands upon thousands of years the Colorado has carved its way down through the strata. We pass the Kaibab limestone, the Coconino sandstone, the Supai formation and come to the top of the Redwall limestone, the most conspicuous of the cliff-making rocks in the Grand Canyon. All these rocks were laid down as sediment beneath the bed of an ancient ocean, late in carboniferous times. Yet these are the youngest rocks in the Grand Canyon formation.

We dismount and walk when we reach the series of pitches known as Jacob's Ladder, but are soon among the tangled alders of the Indian Garden, where seven pronghorn antelope lie peacefully in the shade. They were brought from northern Nevada by the National Park Service and are a reminder, at least, of the great herds that once roamed the north rim of the Canyon over toward the Painted Desert country. Today there are only a few and in isolated sections.

The Tonto Plateau is a broad desert shelf, probably too warm in the summer for the successful propagation of an antelope herd. Yet these seven are fed solicitously by the Park Rangers and as camera subjects were chiefly difficult because their curiosity moved them to come too near the camera. We photographed antelope to our hearts' content and then made camp on a grassy spot behind the ruins of an old mining camp. We feasted on bacon, potatoes and canned peas in the shadow of the towering wall behind us.

In the morning, after a few slow motion shots at antelope, we took the Tonto Trail and wound down, in and out of the many cracks which feed the gorge of the Colorado. Cactus with blossoms of pink and rose and magenta bloomed by the trailside, and now and then we caught glimpses of the great river which had made this Canyon. Soon we joined the Kaibab Trail, the direct route to the Canyon bottom. There was more spectacular going, the trail switching into a tangle of gold ribbon on its way down to the gorge of the Colorado. Across the river below was spun a new steel suspension bridge, supplanting the old one which swung from side to side in the wind and across which one mule at a time was allowed to go. The new bridge is a feat of engineering because every piece of steel and every foot of cable had to be brought down the steep trail from above.

Somehow the granite gorge of the swirling river seemed more comprehensible than the whole expanse of the Canyon. Here we stepped across rock of the oldest known age in the world's formation. We had travelled

down through the ages as our trail wound back and forth. Cenozoic and Mesozoic were left behind in the Painted Desert. The Paleozoic, or old life period, we had traversed, and we were now back to the time of primordial life. Just as we refer to the prehistoric days of human history, so in consideration of the Algonkian rock of Archean times we were almost back to the pre-geologic. Little is known of that earliest stage of the world.

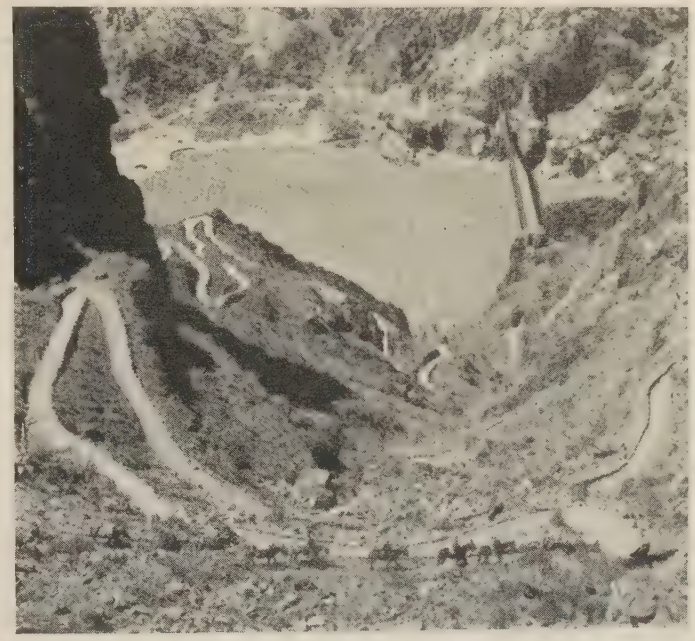
Soon we came to the mouth of Bright Angel Creek and then to Phantom Ranch. A cluster of low stone buildings and frame cabins form the ranch, which serves over-night visitors to the Canyon's depths. There we again met the Baileys and Mr. McKee, and that night we joined in a bat hunt, for it was that which had brought the naturalist to the Canyon's bottom. He had, it happened, shot a chuckwalla for collecting and, since we had heard that the Indians relished this lizard-like animal as food, we determined to try its flesh after Mr. Bailey had carefully preserved the skin. It was gamey and tough and there was a mere sliver of meat for each one. The Indian will have no competition from us with chuckwalla meals.

Next morning we set up our motion picture cameras near some clumps of prickly pear cactus. Two of these cacti appeared exactly alike, but one had pink flowers and the other yellow. The black-chinned and broad-tailed hummingbird showed no preference, however, and we were able to get some pictures of these tiny feathered souls as they fed on the nectar. Later in the day we had remarkably good luck at photographing the courting antics of the large scaly lizards which were everywhere on the rocks. The female lizard was sunning herself on a rock, while the male hunted insects nearby. Suddenly he ran over to her rock, climbed upon it and began running around, above and beneath her, all the time humping himself up and down like a bellows and blowing out his throat. Then she entered into the dance and they wove and interwove in circles.

Again that night we sought bats, aided by two well-known motion picture actors. None of us—actors, wild life photographers or naturalists—had any success that night, and the first honors went to the boy who washed dishes at the camp, who garnered two specimens. There is probably a moral there somewhere.

The next morning we mounted our trusty mules again and rode up Bright Angel Canyon. Our guide said that the rushing water contained trout but the fishing season was not yet open, so we contented ourselves with the wild life about us. Just above the Ranch Gambel quail crowed and clucked among the willows, sometimes running across the open. The bees and hummingbirds buzzed about the cactus blossoms. On we rode, following the trail between the steep canyon's walls, upward past Bridal Veil Falls and Roaring Springs toward the North Rim of the Grand Canyon.

This northern rim is about one thousand feet higher than the south rim, and there Grand Canyon Lodge clings firmly. From its terraces the eye again meets so grand and unbelievable an ensemble of giant buttes, gorges and amphitheaters that the mind flags. Only days of contemplation, nights of moonlight and starlight can begin to etch the tremendous



WINDING LIKE A GOLDEN RIBBON

The trail down to the marvellous suspension bridge across the Colorado

WE MET AND FILMED ANTELOPE

The few animals halfway down the canyon were quite tame and posed well

view upon human consciousness. For this sort of thing there is no preparation; nothing ever seen before can equip the beholder to grasp anything but his own insignificance.

To attempt to understand and absorb this scene requires solitude away from uniformed bell boys and arriving tourists. This the North Rim affords, and so we drove northward toward the Park boundary and turned off to the west on a winding narrow track. At intervals bunches of mule deer surveyed us from clearings, and we risked enough time to try to catch and film a wayside porcupine. On our way again we were surprised to see three coyotes trot leisurely across the road ahead. We stopped and Mrs. Pack commenced to whine at them, dog fashion. She is really good at it; so good that one of the coyotes stopped, sat down on his haunches, cocked his ears like a police dog and listened. If only there had been more light, it would have made a marvelous picture.

ONE OF THE CAREFULLY-GUARDED TURNS IN THE CANYON TRAIL

While there is a thrill there is little danger in the trip down on sturdy, trail-wise mules

We hurried on and suddenly our road turned abruptly upward against a sky of orange. Two deer stood in perfect silhouette against the sunset, then bounded off. It was a glorious, breathless view from here, whetting our appetites for Point Sublime. Soon we stopped our car and verily this point is well named. Before us in the afterglow lay the Canyon, deep and mysterious in purpling light. The sky, red and orange with rainbow-colored rays, glowed with beauty beyond words. We sat silently as the purple dusk stole up from the west, while the gray and misty shadows filled the gorge and overflowed on the plateau. The moon came out. Life was perfect.

(Continued on page 397)

GRAND CANYON LODGE; NORTH RIM

The goal of the trip from one rim of the Grand Canyon to the other

Yosemite Trees Saved

Public Purchases Endangered Timber

by Horace M. Albright

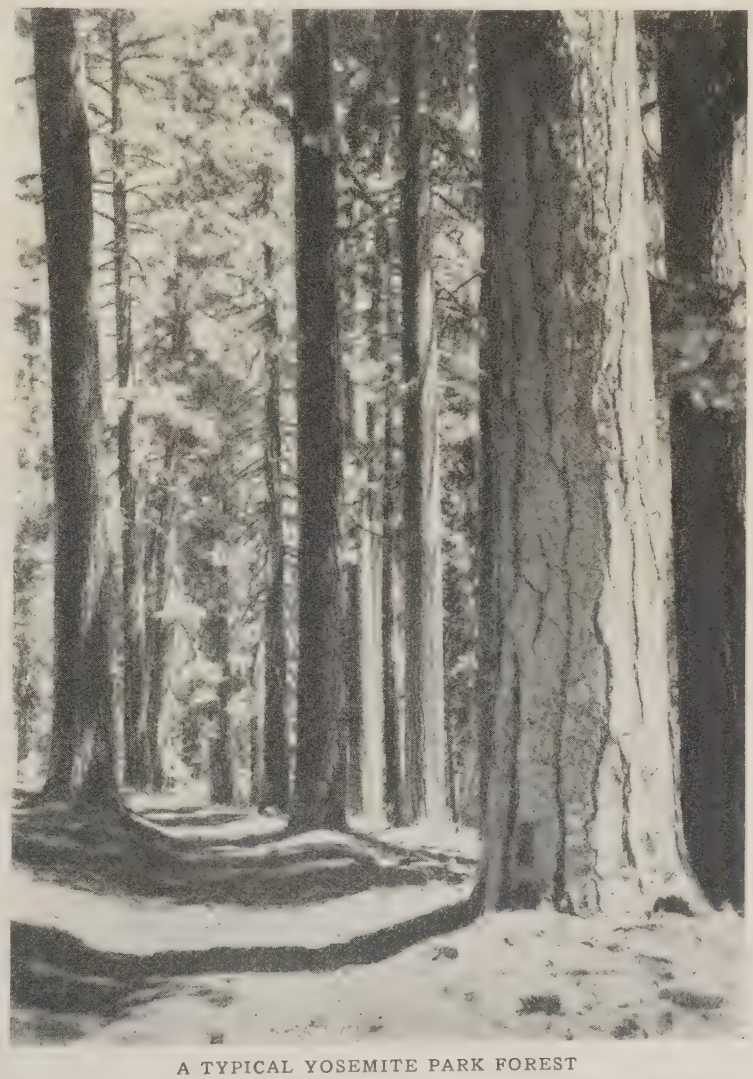
Director, National Parks Service

Mr. Albright's announcement marks a red-letter day in National Park development, and members of the American Nature Association may feel pardonable pride in the fact that their organization did its bit to save Yosemite trees. The lion's share of the credit goes, of course, to the Park Service and Mr. Rockefeller, whose National Park benefactions have earned him an enduring place in park history. Yosemite's friends will also remember Mr. George A. Ball of Muncie, Indiana, whose $8000 gift to the government of the important Fassett holding, on Glacier Point Road, made certain that successful negotiations with the Sugar Pine Company would clear Yosemite once and for all.

The long struggle to preserve the magnificent sugar and yellow pine forests in private ownership in Yosemite National Park, marked for early lumbering, has been successfully terminated and the trees saved to the Nation for all time. Recently negotiations were successfully concluded for acquiring approximately 13,000 acres of these private lands in and adjacent to the park. This is but the first big step in the avowed purpose of Congress to eliminate, as rapidly as possible, all private ownership within national park boundaries.

Visitors of the future, motoring over the Big Oak Flat Road, planned for early construction, will drive through some of the finest stands of timber in the park. Had the timber acquisition not been successful, the road as now planned for location would pass for miles through a devastated area.

That portion of the Big Oak Flat Road outside the park, which also passes through private holdings, is to be built as part of the California state highway system. Its location was established several years ago by a joint location survey carried on by the State Highway Department, the National Park Service, and the Forest Service. In the agreement providing for the acquisition of the private lands in the park, arrangements were also made for selective cutting on this outside portion of the proposed road. The owners have agreed to use especial care, in their logging operations, to save the finest individual specimens and selected groups of trees along the roadway. They have also agreed to protect the timber that is left after logging is completed, and to clean up all slashings so as to preserve a presentable appearance.



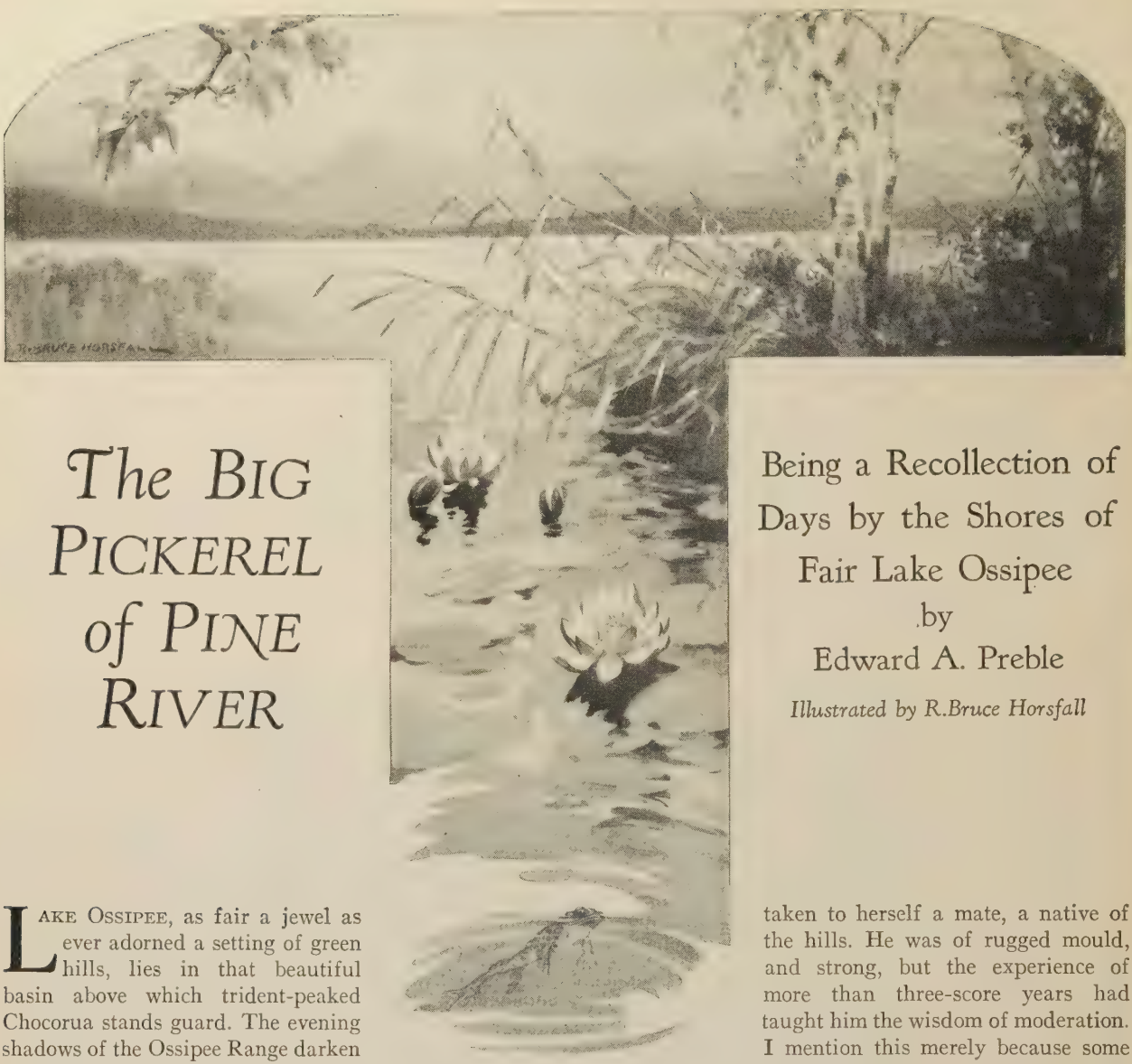
A TYPICAL YOSEMITE PARK FOREST

For years the axe and saw have threatened them and, with them, the beauty of Yosemite. At last, however, they have been given the sanctuary their worth deserves by Park friends

The purchase price of the private holdings secured for the Government is approximately $3,300,000, of which half will be defrayed from the appropriation provided by Congress for private-land acquisition. The other half will be contributed by Mr. John D. Rockefeller, Jr., who has taken such a practical, public-spirited interest in this and other national-park problems.

The Nation owes a dept of gratitude to Mr. Rockefeller and to those members of Congress, particularly Chairman Louis C. Cramton,

(*Continued on page 408*)



The Big Pickerel of Pine River

Being a Recollection of Days by the Shores of Fair Lake Ossipee

by

Edward A. Preble

Illustrated by R.Bruce Horsfall

Lake Ossipee, as fair a jewel as ever adorned a setting of green hills, lies in that beautiful basin above which trident-peaked Chocorua stands guard. The evening shadows of the Ossipee Range darken its clear flood, and to the northeast are the low hills of Freedom. Streams whose praises have been sung in undying poetry lose themselves in its waters, while other tributaries of commonplace naming are unknown to fame, though very dear to those whose childhood memories are woven about them. Chief of these is the Pine, and among the myriad incidents that crowd my early recollections of its winding course, those concerning a giant pickerel seem to urge the telling.

More years ago than I care to count three brothers used to spend each summer in Ossipee's paradise of lake and mountain, and take toll of her products. Not of the timber that was stripped from her hills, nor of the crops wrung from the rock-strewn soil that helped to give the Granite State its name, but rather of those intangible yet enduring riches that are ever free to those who cherish them—the evening hymn of the hermit thrush, the gentle voice of breezes filtering through the boughs of soft-needled pines, the splash of spotted trout, the indigo of autumn gentian. These and legions of other dear memories of those joyous visits to the ancestral acres remain to enrich our later years.

Our grandmother, late in life, being long bereft, had taken to herself a mate, a native of the hills. He was of rugged mould, and strong, but the experience of more than three-score years had taught him the wisdom of moderation. I mention this merely because some had poor opinion of his industry, as is the custom of those whose wont it is to prescribe in what manner the energies of others shall be spent. But the loving memory of many summer days passed under his guidance urges me to take up his defense. Who among his traducers would have cared to follow where he led us on long tramps over the mountains to haunt of nesting heron or hidden pool beloved of trout, discovered during a long life spent in retracing the boundaries laid down on many an ancient deed? In such loving tasks he gave freely, both in energy and time.

On a certain July day in that long ago Grandpa William took the two oldest of us boys on a fishing trip to Pine River. This meant pickerel—a magic word in our youth. It was, in country parlance, a lowery day, the kind prescribed by custom and tradition as most favorable for fishing, and, moreover, unsuitable for haying. Such days, interspersed among clear ones, seem to afford sure proof that an all-wise Creator did not intend man for labor alone. The hermit thrush, undismayed by an overcast sky, sung his song of praise from the pines; from the tamarack swamp came the clear high notes of the white-throated sparrow; and here and there a veery unwound his strange wild song.

"HIS SUPPLE BODY ARCHED ITSELF FOR A MOMENT, HALF OUT OF THE WATER, AS THE BAIT VANISHED BETWEEN HIS BROAD NEEDLE-ARMED JAWS"

And so, in happy company, and with fishing poles on our shoulders, we trudged along until the village was left behind and we were on the forest-bordered hay-road leading to the river of our hopes.

Pine River rises among the hills many miles to the south, and by the time it nears the lake has become a good-sized stream. Little sediment clouds its waters, but in its course it has drained many a swamp of its moss-stained moisture, and its flood is dark. Now its hurry is over, and as it leisurely winds between high banks the direction of its current is scarcely betrayed save by the slender waving stems of pondweed that point lakeward. Where it emerges from the deep woods and meanders the mile-broad hay meadows that here border the lake, only an occasional thicket of buttonwood or sweet gale, with here and there a swamp maple, overhung its deep waters in the days of which I speak. Near the lake little reedy ponds and inlets, with sandy ridges between, held the chance of a big fish, and always were the haunts of herons and other interesting possibilities.

Now Pine River was not unknown to us, and hopes were high as we threw our frog-baited hooks into each well-remembered place, deftly trailing them past the tangles of waving pondweed, and along the edges of lily patches that bordered the deeper pools. For a half-hour or so no success whose memory has stood the test of years rewarded our art. But finally we came to a place where a narrow vista between two spreading maples gave access to a pool whose dark depths surely deserved to be the lurking place of some pickerel of more than ordinary note. A circle of lily pads, their floating leaves anchored by stems rooted far below, rimmed a space whose depths had never been revealed to human eye. Amid those broad leafy discs the cups of cow-lilies mingled their gold with the dazzling white star-blossoms of that lovely plant well-named for the water-nymphs who lived in the clear springs of the Mount of Parnassus. But I fear that at the moment I paid but scant heed to the beauties of the river, for my frog-bait had made scarce a yard of its jerky journey across the pool when a great fish, shining with green and gold, threw himself upon it with a mighty splash. His supple body arched itself for a moment, half out of water, as the bait vanished between his broad needle-armed jaws, and then he plunged back to the shelter of the reedy depths from which he had come. Such a fish the old men talked of, but we boys had never even dreamed that one could still live in Pine River. The radiating waves curled the edges of a thousand undulating lily leaves, and lapped away their strength on the bank at our feet, as a hundred flowers nodded their bright heads on each circling verge. But flower and wave were little noted, for from the depths came instantly the savage tug telling that the time for action had come.

In those days the way of a fisherman with a reel and the lore of gaff and landing-net were known to us only in that vague fashion that comes from the hearing of customs practiced, as it were, by an alien tribe. We had read that some men, after hooking a fish, would allow it to stay in the water and cherish for a time the hope that it might yet escape the barbed death that gripped it. Such a method, however, held little virtue in our eyes. We bore no vengeful feeling against our friends of the water that we should thus prolong the agony of a creature we had, it is true, cruelly deceived, but which we still loved. Besides, the fish might get away. And so it was our habit to lose no time in uncertain and fruitless by-play, but to transfer our prey without delay from its own element to ours. In short, I tried with all my youthful strength to drag that monster out upon the bank, and just when success seemed sure, my line, scarred by the sharp teeth of many lesser fish, parted company with the hook, and the great pickerel slid back into the depths. Why attempt to tell more?

With as good heart as might be borne by those who had suffered such loss, we fished the stretch that lay between this spot and the place where the Pine mingles its dark waters with the clearer flood of the broad lake, beguiling from other pools, with such scant enthusiasm as befitted the occasion, a goodly string of pickerel of lesser size, but we were sure none that might not have been swallowed entire by that lost one. Prob-

ably as usual, we scared up bittern and duck from the reeds; I have forgotten.

It was well along in the afternoon when, on our way up the river, we again neared the scene of the tragedy. That a fish that had fought and run away might forgive and forget was not unheard of, but this one had suffered such indignity that our hopes, though still alive, were low indeed. It seemed to be tacitly agreed that I had had my chance, and had failed, and that to Grandpa belonged the next opportunity. Moreover, he had a patent contrivance, a double-pointed hook that was supposed to spread outward when fairly within the fish's mouth, and to find such firm lodgment as to be surely fatal. So his bait was cast forth, and instantly, to our astonishment, was seized with a rush and a splash, and dragged below those dark depths.

As before the preliminaries were brief, and while the slender pole of rock maple bent almost double in the old man's powerful grip, the struggling monster was lifted out of the water and half way up the sloping bank. Then, when he was almost within our grasp, the patent hook slipped from the bony mouth, and for the second time the great fish was free. "Well, he's gone now," said the old man, with an air of resignation that we boys could not understand. "We won't ever see *him* again."

"INSTANTLY MY TWO THUMBS WERE SLIPPED BENEATH HIS GILL COVERS, AND WHEN HE SENSED HIS PLIGHT, IT WAS TOO LATE"

But my sharp eyes had never wandered an inch from the gold-flecked giant from the moment of his second voracious rush, and to my amazement and joy I saw that he lingered for a second or two in the shallow water at the base of the bank, evidently somewhat dazed by his exertions and the fall. That brief delay marked the failure of his last opportunity, for with the swiftness of an otter on his slide I slipped down the ten feet of oozy slope. As I slid I turned sideways and when I struck the margin one foot was planted firmly in the water on each side of the great fish. Instantly my two thumbs were slipped beneath his gill covers, and when he sensed his plight, it was too late. With hands cruelly lacerated by the sharp teeth of the gill arches, but with a happy though loud-thumping heart, I climbed the slippery bank with the struggling fish, aided by the cheering words of the old man, and by the tearful plea of my young brother: "Oh, Ed, don't let him go." When safely on the solid ground of the grassy meadow I carried my burden a full thirty feet back from the margin before I would lay him down. How we admired his sides of green and gold, divided into triangles and squares and rhomboids by the dark reticulating lines that mark the chain pickerel, that silvered belly whose neutral tint so aids the fish in his marvelous ability to make himself invisible at will, those greenish fins and the broad tail tipped with blotches of faint red. How carefully my brother watched, pouncing heavily upon the fish whenever a spasmodic heave of the lithe body moved it a length nearer the water! And there, fast anchored in his upper jaw, he still bore my hook.

There was no more fishing that day. The great fish and his lesser brethren were disposed on a strong withe in such manner that the length and depth of the monster was in no wise hidden, and shouldering our poles we trudged for home. Our cup was full. We boys did not even ask to carry the fish, a task indeed that would have forced the tail of the great one to trail in the dust. With what pride we recounted each detail of the adventure to envious admirers! Since that time, in many distant waters, larger fishes have yielded to my art, or mayhap have gone their victorious ways, but always, when fish are mentioned, that day leads all others in glory.

COLOR IN NATURE MAGAZINE

It had been hoped to return color pages to Nature Magazine with this issue but mechanical consideration incident to the complicated process of color reproduction made it impossible to make the "dead-line" so color pages will not appear until the July issue.

A YOUTHFUL GOLDFINCH SURVEYS THE NEW WORLD ABOUT HIM FROM A LIMB NEAR HIS ERSTWHILE HOME

He is grown earlier than the waterbirds but must spend his first week in a gaping helplessness

NATURE'S PRECOCIOUS BABES

From Egg to Self-Reliant Life in Birddom

by Hamilton M. Laing

Photographs by the Author

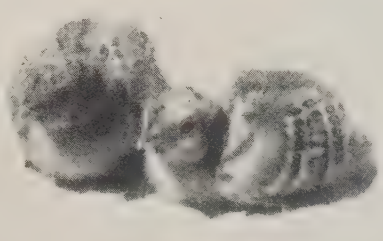
SOME summer's day as we watch the leave-taking of a young robin from the nest on the veranda pillar and realize that twelve days previously he was but an egg, we are apt to feel that in such of Nature's children as these we see the climax of precocity. Twelve days between that blue egg-shell and the first little flight to a perch! Surely we might hand the prize to young Redbreast. But let us examine the nursery records of all of our birds and do it with the eye and patience of the naturalist, and we will find our young robin—or any other of the common perching birds, the higher types—is far from the head of the class in this matter of early intelligence. Indeed he is greatly outdistanced by the lowly water birds, the sandpipers and the grouse.

The early days of our birds always comprise one of the most fascinating chapters of their life histories. Taking the robin as a type, on account of its familiarity to all—though any perching bird is similar—we see the tiny young emerge from the pipped egg—pink, naked atoms of big-mouthed helplessness. It is a week before they really begin to resemble birds and even when they leave the nest they bear all over them the stamp of immaturity. Contrast with this the liveliness of sandpiper, coot, grebe, duck or grouse youngling.

I was directed one day to the nest of a pinnated grouse in a grass plot on a prairie road through Manitoba fields. When at length I found it by flushing the mother grouse, there was one of the dozen eggs pipped. About three hours later I returned with my camera to try to get a picture of the grouse, and lo! the nest was empty except for some egg-shells. Gone! No, the mother had not carried them away. They had walked. As soon as the down on their tiny bodies was dry they were ready to patter off through the grass with their parent. I quartered about the place but saw not a sign of the family though they could not have been far away.

Another warm day in early July I watched a family of sharp-tailed grouse in their first

MR. LAING *is a newcomer to the pages of Nature Magazine but will be intimately known to some readers since he will be the naturalist with the two Nature Magazine parties in Jasper National Park, Canada, this summer. His article, which will have successors, surely invites one to know him better.*



BABY SHARP-TAILED GROUSE

Note the early development of the wings of the downlings

YOUNG BLACK MARSH TERN
Soon after hatching the young swim off upon the marsh

YOUNG ROBIN LEAVING THE NEST
The eared grebe, whose first act after hatching was to take the shell to the water

hours in the world. At 2:30 P.M. when the mother grouse was flushed from her nest in the grass, nine of the ten eggs were pipped. Feeling that no harm could come to the young on such a day from absence of the mother, I watched the proceedings. At 3:15 P. M. two young were hatched and three more having a violent race in getting out of the big end of their shells. Half an hour later these hatched almost simultaneously. By now the first two arrivals were dry and fluffy and showing a lively tendency to run off in the grass. By 5:45 when I went away, hatching was almost complete though one egg was not yet pipped. Yet I feel sure that had the mother been allowed to hover her young, the process would have gone forward with much greater speed.

In the dusk of evening I stole up to the nest again. The mother was brooding, sitting high in the nest, hovering the downlings below her. That she was there at all was probably due to a high cold wind having come suddenly. That night it rained heavily—a drenching downpour and it was with great misgiving that next morning I approached the nest. It was empty—a mass of shells only. Then ten feet away the mother fluttered off, pretending to be crippled, and from the spot, ten little yellow animated fuzz-balls started running in ten directions. A trifle over twelve hours old and able to run in the cold wet grass! I rushed away and hoped that the mother in a moment would call them under her breast again, and that no marauding crow or other enemy would come that way.

The young ruffed grouse of the woods start out equally strong and nimble. No week of naked, big-gaped helplessness for them. In a day they are picking up their own food, the mother being mainly concerned not with putting food in their mouths but in leading them to the good feeding places and keeping a sharp lookout for the innumerable enemies of grouse babies—and grouse mothers too. The early development of their wings is marvellous. Their legs are strong within an hour after hatching, and within a week the tiny flight feathers are developing in their little wings. By the time they are the size of meadowlarks they are strong fliers. It is this trick that goes far to keep grouse in existence. Were they unable to fly till late in their development a fox or coyote or weasel would play havoc with the covey the first time he found it.

The young of plovers and sandpipers show almost equal precocity with the grouse, but they are unable to use their wings so early. Their legs are nimbleness itself almost as soon as they have kicked loose from the shell and soon they patter ceaselessly and never seem to tire. The young of these birds, however, are little known to most of us as for the greater part they are hatched far north; but for types of this clan we need go no farther than the common spotted sandpiper that nests along almost every stream in America, and the killdeer plover found in almost every pasture lot.

Watch the killdeer's black-spotted brown eggs as they lie in their depression—if you are clever enough to be able to find it—and like as not some day you will find them suddenly gone and four tiny toddling downy balls of gray and black and white abroad on the pasture. That is, if you are again clever enough to find them. Comical,

stilt-legged, big-footed midgets they are, with a wise-for-their-years gleam in their brown eyes. They know all about the tricks of hiding as soon as they are dry. It is even more interesting to see the second brood of downlings on their stilt legs as the first brood, now on the wing, joins in with parents in common cause against invasion of the kindergarten.

What we see of the tiny killdeer running off as soon as dry to find his food and hide from his foes, is true of all his kindred: the big marbled godwit or willet on the prairie, the curlew on the dry plains, or the black-bellied or golden plover of the northern tundra.

The tiny downlings of the gulls always strike me as precocious youngsters denied the right of showing what stuff they are made of by the exigencies of their early environment. They have harsh parents; they are cramped in a confining nursery; their world is cruel. For though very early after hatching, even within a day or two, they are nimble-footed, bright-witted little chaps, they are subject to the tyranny of a breeding rock that serves a whole colony where each pair of parents claims but a very limited area, and so each downling must not stray. Indeed when he does so he is liable to have his head pecked off by an unappreciative parent neighbor. I always enter a gull rookery with the greatest misgivings, for almost every invasion that causes a mixup in the kindergarten brings direful trouble for the innocents.

This is not so true of some of the smaller gulls and of the terns. In the case of the little Franklin's gull of the interior, nesting on the plainland lakes and marshes of the north-west, I have repeatedly driven my canoe through the nursery and seen hundreds and sometimes thousands of tiny gray-brown downlings paddling off across the water. They have room to express their talents a bit. Very soon after hatching on their floating nest of rush-stems, they take to the water and more or less live on it like a duckling till the new wing quills grow to lift them aloft into their real element.

This is true also of the black marsh tern. Like the little gull, this tern allows room enough in the nursery for the young to expand. The latter take to the water and swim as naturally almost as they breathe and they are as nimble of leg in their element as the young grouse or sandpiper is ashore. No water birds of any sort, however, show the early wing development and flight precocity of the grouse chick.

It is among such water birds and others that we see the really truly clever infants. That is, early, inborn cleverness; for the young robin or goldfinch is grown up vastly earlier than any of the young of the marsh folk. But whereas the redbreast, two days old, is a complete nonentity as far as intelligence is concerned, the young grebe or coot or duckling is already master of the water, and in the case of the duckling, also at home on shore and able to find a meal for himself.

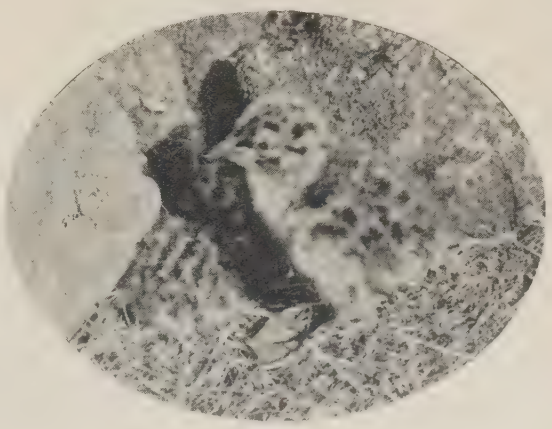
I stood one day beside a nest of an eared grebe on a Manitoba marsh and watched a case of grebe chick behavior so strange that I almost hesitate to tell of it. A friend was wading with me and when we sighted the new chick he had his head and neck thrust into the large half of the vacated shell. He was still wet, having just pulled clear of his prison. As I planted my camera

YOUNG SHARP-TAILED GROUSE

When but the size of a sparrow he can fly with some speed

BABY COOT ON HIS CRADLE

Below a glaucous-winged gull chick is nimble about the nest at an early age



before the nest, my assistant pulled the egg-cap off the chick. But what was this? The wet chick shuffled forward, crawling on fours like the little lizard that he was, thrust his head again into the blue-white shell-chamber and then crawled off with it. He pushed it down the little heap of soggy decaying vegetation that had been the egg-cradle and after pushing it into the water, returned to his original position. Here was an infant this hour born, ridding himself of the tell-tale egg-shell, and in another hour or two when dried into fluffy respectability below mother's warm breast, would be ready to go floating on his element and perhaps navigate under water as well.

I have never been able to learn just how early a grebe chick is master of his element. They can swim as soon as they are dry, but they do not seem to dive so naturally and it is probable that their first experience under water is often brought about by the parent. These downlings have a way of riding on the parental back and often they are carried apparently under the wing with but the head peeping out. In this position I have often seen them taken under water to be carried a few yards and liberated—and bob up to the surface like corks—the parent emerging more distantly. But no matter how they take their first dip, it is certain that within a day or two they dive as naturally as they swim—or breathe. They do not learn these things, but know instinctively—they bring the knowledge with them from the egg.

CANADA GOSLINGS ARE TRULY PRECOCIOUS

In ten weeks they are feathered giants with new wings that will carry them off with devoted parents

Much of the same aquatic precocity is seen in the commoner coots or "mud hens". The coot is really a very clever bird, more successful than most water birds in making a living, and a little of his keenness begins in the cradle. The mother coot, unlike the grouse, regulates the hatching of her brood so that the youngsters come along one or two a day. As soon as the tiny cootlets—beautiful black downies with scarlet trimmings—are dry they are conducted by the parents from the nest to the shelter of the rushes—their future home till they are nearly fully grown. In the matter of swimming and diving, the coot chick is as capable as the grebe, but he also has the advantage of a good pair of legs adapted to locomotion ashore. So, early in life, he climbs upon rat-houses and floating debris, and even patters on the shore in sheltered places. Again in food-finding he can show tricks to the grebelet. For though the latter must be fed by the parent till he is well along toward maturity, the young coot soon casts off from parents and finds his own way in a world not too easy at the best.

For similar capability in juveniles we need look no farther than the geese and ducks. The hatful of ducklings or goslings hatched in the farmyard under a hen foster-mother—that knows nothing of raising such young—will patter right off with a cock-sure knowledge of the way to make a living that is splendid and comical in a week, when the harassed foster-mother is following, not leading her charges.

As soon as the downlings of the pond ducks—mallard, pintail, teal, spoonbill and such—are dry, they are lively and ready to leave the down-lined nest and follow mother through marsh and meadow or often make a long overland traverse of a quarter of a mile to reach their aquatic home. The mother is merely their leader and adviser and warden. The downlings know instinctively what to eat and where to get it, to run to water before land foe, to dive below the surface from foe of the air. When the young of the more aquatic deep-diving ducks such as canvasback, red-head or scaup have dried into a fluffy state they are ready to toddle off the nest and paddle away on their element like grebes. Yet they are more clever than grebes as they at once find their own food. In the case of loss of mother, young ducklings of any kind do not necessarily perish as the young of other birds would, if deprived of both parents—ducklings having only a mother to guard them, of course, while most young have two parents. For in event of such tragedy these sturdy and independent little midgets either attach themselves to another brood or carry on by themselves as usual. So little is a mother necessary to duckling broods that several species have a habit of uniting two or three families into a sort of kindergarten, a single mother taking charge at a time. I have repeatedly seen over twenty downy golden-eyes escorted by a single female, and even a larger train of blackish followers behind a white-winged scoter.

For sheer hardihood of ducklings let us watch the golden-eye nest in the tree hole. Forty feet from the ground sometimes the downlings are born and then when they are ready—which, as in the case of all others of the clan, is but a matter of hours—the mother merely goes below and calls to her children and the nest-hole boils over and down they come tumbling. There is no hesitation. We might expect such a tumble to dash the life from a young and tender thing, but not so. For these are the hardiest of their kind. Nor is this the com-

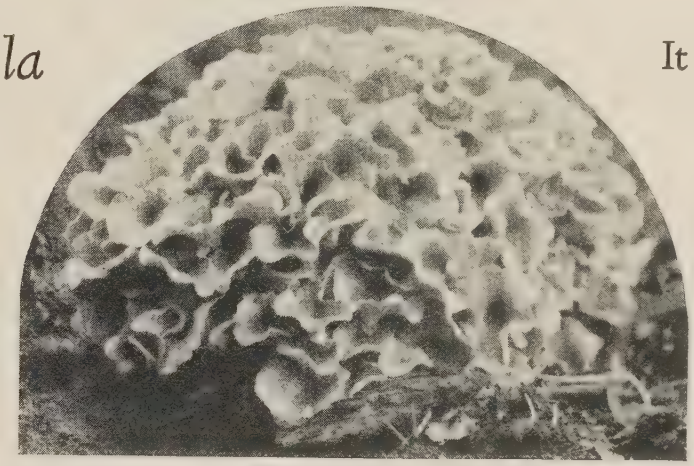
plete story. For before the youngster can get from the nest, in many cases he must climb—yes, climb up the wooden walls that confine him. But he is equal to it, his tiny toes and wings—which latter are as yet but fore legs—enabling him to scale the rough wall. So these little fellows within the space of an hour in their first day of life, climb, tumble, run, swim and dive.

In point of early cleverness the young of geese, too, are remarkable and measure up on a par with the downies of the pond ducks. But they are perhaps less capable, for they have two parents to minister to their safety, and anyone who has made a study of a nesting Canada goose knows that there are no more devoted and sagacious parents in the wild. I live in hopes that some day I will see the departure from the nest of a family of goslings hatched in the tree tops. In southern British Columbia the Canadas commonly lay in old osprey nests. I have seen them several times incubating a hundred feet from the ground. That the little fellows tumble down, just as the golden-eyes do, is almost a certainty. What nerve! What toughness in a baby is displayed here! Truly, it is a rough, even if fitting, initiation into the hard world of danger that they are starting out to face. And the gosling shows the stuff in him otherwise, for in ten weeks the yellow downling will be downling no longer but a feathered giant much like his elders with new-grown wing quills that will bear him off on a maiden flight with his devoted parents.

Chicken *a la* Fungus

It Makes a Tasty Dish

by G. G. Nearing



(Right) HEN-OF-THE-WOODS IN ITS PRIME
A five pound specimen just before going into the cooking pot to make a delicious meal

(Below) JUST BARELY OUT OF THE GROUND
This plant is less than a day old, and in two more days will be four pounds of tender food

Why should a fungus be called Hen-of-the-woods? If you knew this mushroom, which masquerades in Latin as *Polyporus umbellatus*, you would see the aptness of the sobriquet, for in size, weight and general appearance it is not unlike a setting hen. And although it does not have chicks, you will often find fresh specimens in the same spot for years to come.

As a matter of fact, "Hen-of-the-woods" strictly belongs to a slightly different species, with irregular caps, named *Polyporus intybaceus*. But as we have no common name for *umbellatus*, we may borrow the title from the Vosges. Both these varieties are a part of a family of several species which are much alike and all good to eat. The barn-yard name may well take them all under its wing.

Think of stepping into the woods some summer morning and picking a single mushroom that weighs five or six pounds—enough for several meals! It does not look exactly like a single one however. Rather it seems to be a whole colony of little mushrooms growing on a branched stem often as fat as your two fists. Yet all spring from one root by a common stem.

The separate mushroom caps are not gilled beneath, but porous like a fine honeycomb. Cut them up together and dice the stem for cooking, unless worms have already hollowed the solid flesh. If you are an early bird you will catch the vermin napping, and enjoy a good meal at their expense.

Polyporus umbellatus springs up occasionally in the shade of beech and oak trees from May until September. In favored spots it will appear every two or three weeks for many years. The general color is pale gray, yellow or brown, shading into white on the almost hidden stem. No poisonous fungus resembles this one in the least. All that follow this peculiar system of growth are good to eat, although some species are tough. They require long slow cooking, but amply repay for the trouble.

There is another edible mushroom, *Clitocybe monadelpha*, which grows in clumps, and looks much like Hen-of-the-woods from a distance. When you pick it however you will find that it consists of separate mushrooms on long slender stems. The under surface of the cap bears gills like the common mushroom.

The Duped Caterpillar

It Was Led Astray by Turning its Home

by Violet Findlay

Photographs by the Author

THE WAY THE PUPA SPENT THE WINTER

The fine silk threads at the top formed the cocoon. The pupa case clings to the side of the receptacle

THE caterpillar that we brought home was the light green larva of the Polyphemus moth. It was found on a main street in the city of Wilmington, Delaware, by a Nature student and was taken into the schoolroom, where in solitary glory it ruled the attention of the interested students. The only receptacle handy in which to put it was a quart jar, and into this, with a leaf for company, we placed the little caterpillar.

Closely we watched it from day to day, now and then moving the jar. Soon most surprising developments took place. The larva ate little, and one day was found near the mouth of her home moving her head very slowly back and forth. The surface of the receptacle, over a limited area, became covered with minute silk threads. These were guy wires of a growing cocoon, and were fastened from the top and sides. Soon the cocoon began to take shape. We early discovered that if the caterpillar was moved as the observer turned the jar it began weaving where it happened to be, and did not return to where it had left the strand before. This interrupted manufacture of the cocoon resulted, due to our desire for experimenting, in a most fantastic arrangement as seen in the illustrations.

One side remained unfinished, and as a result of our observations, we determined that the length of time of the larva's weaving efforts depend not on completion of the cocoon, but on her supply of material. For the final shedding took place when the weaving was far from satisfactorily finished, and over night, the form of the larva assumed the shape of the pupa case, with abdominal segments, thorax, wings, and antennae all showing the effects of the interrupted weaving.

One wing showed a malformation due to a quick turn of the jar made by an observer. At first this case was pale green but gradually turned to a dark brown.

It will be observed that this change to the pupal stage took place outside the cocoon. Yet the larva remained in the jar all winter, in the changing temperature of a rather poorly heated room. No effort was made to keep the pupa artificially warm.

In the spring the pupa hatched, and the moth had one deformed wing, which proved that the ultimate form of the adult is definitely determined by the first change in the autumn.

It is curious how these life stages take place even when circumstances vary from the normal. The malformations were caused by the very human desire to experiment and satisfy curiosity, but to the limit of its ability the caterpillar surmounted the difficulties it faced and did the next best thing—which was to change into an adult outside of its usual silken covering. What would humans do, if Brobdignagians of the same proportions as man bears to the larva should attempt to thus interfere in their life processes?

It was interesting to see, however, the very narrow limits within which the caterpillar could adapt its program of change. Its habits were machine-like; they kept working in the same routine way no matter what the outside conditions were. If intelligence consists in the remoulding of habit formations to fit definite sets of circumstances, then our caterpillar had little, if any. Yet in the long run, it managed to pull through.

A QUEER PERFORMANCE OF WEAVING

Here is the jar with bottom cut away showing the guy wires and the general shape of the cocoon. Note the pupa case outside

THE LEAF BLIGHT DISEASE

Merely destroying the infected leaves prevents recurrence

Curing Iris Troubles

A Relatively Simple Task

by C. T. Gregory

Purdue University Agricultural Extension Department

CURE THIS WITH GYPSUM

The "mustard seeds" show the presence of the fungus

THE CONTROL of iris diseases and pests is a relatively simple matter. Remove all the dead leaves and cut back the tops either late in fall or early in spring. This simple remedy will rid the plant of all its troubles except one.

A happy combination of conditions makes this possible. Consider, as an example, the common leaf blight, a disease caused by a fungus known as *Didymellina iridis*. In spring the disease first appears as more or less circular yellow spots on the leaves. As the season progresses the spots become more numerous till finally the entire leaf is brown and shrivelled down about the base of the plant. On certain varieties like Iris King, Lent A. Williamson, May Queen, Mrs. Beubronner, White Knight, Beethoven, Gypsy Queen, Perfection, Honorable, Blue Boy, Storm Cloud and Mary Garden the leaves may be almost completely killed. Other varieties may not be so seriously affected.

The fungus spores remain alive all winter on this rubbish and when the new leaves push out in spring they are ready to start their destructive growth. Fortunately the fungus has no other place to live. When we destroy these old leaves and carefully clean out these dead relics of the leaves we remove the source of this blight.

The iris borer lays its eggs on the green leaves of the plant and nearby weeds in fall. In spring these eggs hatch and the young borers work their way down, usually entering the leaves and eating their way into the rhizomes. If the tops are cut rather closely to the soil in late fall and are burned, the borer is thereby attended to.

When a flowering stalk of the iris suddenly falls over we will usually find that the base of the stalk is soft and rotted. The common soft rot bacterium, *Baccillus caratovorus*, is the cause. The affected tissue often has a vile odor.

Like so many other bacteria, this germ needs an insect to open the way into the root. In this case the borer is the culprit. The insect starts the trouble and the bacteria

AN INFECTED PLANT

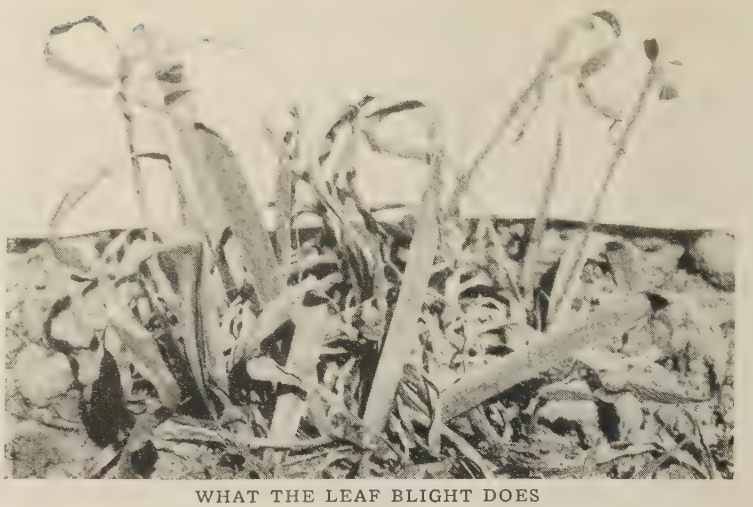
The drooping leaves denote soft rot, one of virulent iris pests

IT MAY BE CURED

Dig up and slash the roots, to cut out the rotted part

finish it. So in cutting the tops of the plants we are killing two pests with one slash.

If, however, a plant becomes infected with the soft rot, then there is little else to do but dig up the root, cut away the rotted part, dust with sulphur and replant. If the trouble appears early in the season before the plants have flowered, it may not be desirable to dig the plant. In such a case make a solution of Uspulun, Semesan or any of the organic mercury compounds and soak the soil about the infected root. This will probably not cure the trouble but it may serve to hold it in check till after flowering time.



WHAT THE LEAF BLIGHT DOES
It has spoiled many a beautiful plant before its bloom

There is another rot of the base of the iris stalk that may be mistaken for this bacterial rot. Examine the rotted stalk. Look for tiny brown mustard-seed-like bodies on the surface of the diseased tissue. The presence of these "mustard seeds" proves that this rot is due to a fungus known as *Sclerotinia Rolfsii.* The control of this rot consists in merely working a big handful of gypsum into the soil about the affected plant. This gypsum is known chemically as calcium sulphate.

CANCER ROOT

by Albert A. Hansen

WHILE rambling in autumn woods, did you ever come across what appeared to be a cluster of slender fir cones standing upright among the fallen leaves? And did you attempt to collect the cones, only to discover that they were all solidly attached to the roots of an oak tree? Of course, you knew something was wrong, because oaks are not cone-bearing trees, and if they were, the cones certainly wouldn't grow directly out of the roots. What, then, can these strange cones be?

The cones really belong to a separate plant known as squaw root or cancer root, a rather rare species that may be found occasionally in rich woods throughout eastern United States. It is a parasitic plant that attaches itself to the roots of trees, principally oaks, from which nourishment is absorbed. Since the object of green leaves is to manufacture food and since the squaw-root steals its nourishment, the plant has no more use for its leaves, which have degenerated through disuse into mere fleshy scales that later dry and become brittle. It is the hardened leaves that give the cone-like aspect of squaw-root during late summer and fall. The scientific name, *Conopholis,* is a compound Greek word that means scaly cone.

A PARASITE ON AN OAK
Note the swollen condition of the oak where the squaw-root is attached

The common names squaw-root and cancer root refer to the effect on the root of the host plant. At the point where the parasite is attached, the tissues of the host become enlarged, much as in human cancer. The flowers of this odd little parasite appear throughout the summer at the tip of the cone where they are partly shielded by the scales.

The squaw-root is included in a unique botanical family all members of which are root parasites. Among its relatives are such singular plants as the broom rapes, a group of weeds parasitic on the roots of flax, tomato, hemp, and tobacco, and the curious witch weed or rooibloem of South Africa, a destructive parasite on the roots of corn. Still better known, perhaps, is beech-drops, found beneath our beech trees from New Brunswick to Florida and west of the Mississippi.

COURTESY NORTHERN PACIFIC R. R.

OFF ON THE TRAIL TO GRASSHOPPER GLACIER

Party leaving Shaw's Camp just as the members of the American Nature Association Yellowstone Party will do this summer

GRASSHOPPERS *on* ICE

Yellowstone Glacier Preserves a Well-known Pest

by William C. Alden

United States Geological Survey

JUST two days out of Cooke City, Montana, nestling in a great cirque at the head of one of the many gorges cutting into Beartooth Plateau northeast of Yellowstone Park, lies Grasshopper Glacier, where millions of grasshoppers rest in cold storage, a grim warning to their ravaging kind.

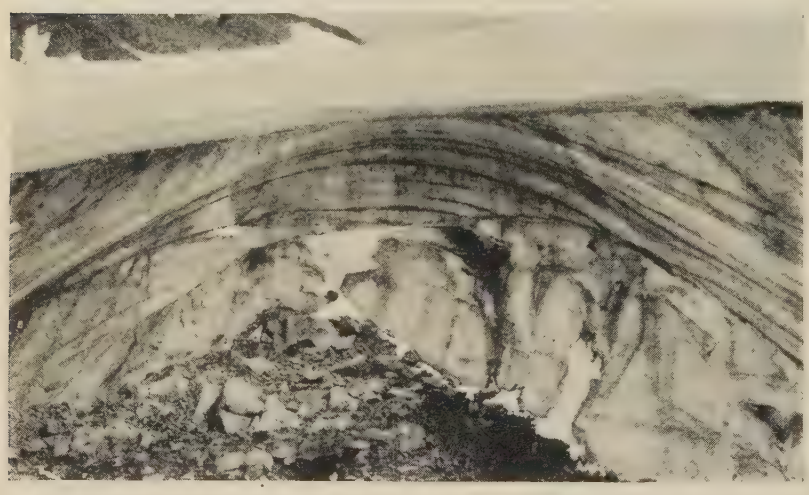
Here, 10,000 feet above the sea, in the sight of tumbling mountains, great escarpments and jewel-like lakes, the farmer can gloat his fill at the endless numbers of *Melanoplus spretus,* the devastating migratory grass-hopper, entombed in a translucent mausoleum by a harsh fate. Here, too, the visitor to Yellowstone may come to marvel at the carefully preserved forms from which life departed years before during some driving mountain storm.

High up on the north flank of Iceberg Peak, within a few miles of several of its kind, is Grasshopper Glacier. From its foot starts West Rosebud Creek, to roar down the gorge it carved itself out of granitic rock until it finds the Yellowstone River. Around it on every side stretch the grim rough-hewn peaks and profound branching canyons. Were the glacier not unusual, the setting of noble grandeur in which it rests would alone be worth the twelve mile ride from Cooke City.

Grasshopper Glacier will be one of the objectives of one of the American Nature Association parties in the Yellowstone this summer

As the sun breaks over the misty peaks and filters through the pines near Cooke City—that is the witching hour we make the start for the glacier, armed with cameras, notebooks and all the paraphernalia of a geologist, and hearty lunches, prepared against vigorous appetites incited by the clear frosty air of the mountains. Cooke lies near the Montana-Wyoming State line at 7,600 foot altitude, just west of the pass where the headwaters of Soda Butte Creek and Clark Fork diverge to southwest and southeast respectively on little jaunts of their own before joining the Yellowstone River. Southward rise the rugged snow-clad peaks of the Absarokas, carved from the mass of the ancient volcano which once rivalled Aetna and Vesuvius. But we faced northeast. Here the land rises gradually and spreads out

THE GOAL OF THE GLACIER VISITORS
A view of Grasshopper Glacier showing the snow covered surface and the frontal ice cliff



CLOSE-UP OF THE FRONTAL ICE CLIFF
This is seventy-five feet high and shows strata arching over an older mass of ice astride a ridge of rock

THE TRAIL ALONG NORTH GOOSE LAKE
Across the lake is the jagged, saw-tooth crest of the mountains rising 11,400 feet above the level of the sea

into a plateau. A part of this highland plain is called the Beartooth Plateau, which sweeps northeastward to the crest of an abrupt mountain front—the famous Beartooth fault—whence it drops suddenly 4,000 to 5,000 feet to the dissected foothills. And somewhere ahead of the noses of our horses, amid the deep gashes of canyons worn down in the granite rocks by tributaries of the Yellowstone River, rests the ice-pack that is our goal.

Leaving the Ranger Station, the smelter, prospect holes and mines that hope—or did hope—to be, we climb Sheep Mountain. From its 10,700 foot summit we can look far out into the hazy distance over the plateau and down the wooded vistas of the valley of Clark Fork. Far below us lies the floor of a broad basin, sparsely wooded and dimpled with hollows scoured out of the granite by the great glaciers of the past. From one point of view we count twenty-five lakelets scattered through the woods and glittering in the sunlight. To the west the cliffs drop away into the mysterious depths of Stillwater Canyon, and beyond, to the northwest, rise the white peaks of the Snowy Range.

From Sheep Mountain, we resume our way northward, past flower-spangled grassy plots interspersed with snow banks and flecked with the shadows of scattered clumps of pine. Much of the uneven surface is bare granite whose rounded and polished ledges still show the grooves and scratches made in many places by the ponderous slow-moving glaciers of the Great Ice Age. We are nearing a center from which the Frost King deployed his glistening cohorts. One of the ancient glaciers near here once advanced more than eighty miles by way of Soda Butte, Lamar and Yellowstone valleys, to the terminal moraine below Emigrant Peak. Others crept thirty to fifty miles toward the northeast, east and southeast down Boulder, Stillwater, Rosebud, Clark Fork and other canyons, and laid their bouldery drift on the borders of the Great Plains.

The last of the dwarfed and scraggly pines at the timberline disappear,and we are at Goose Lake, among the granite peaks. To the north a jagged, saw-tooth crest, unsmoothed by glacier ice, towers high above the lake, and toward this we face, after leaving our horses to graze in the grassy plots among the snow banks. Up, up, up over a talus of loose, angular blocks, to reach a pass 10,000 feet above tidewater, to look northward over country whose wild beauty is equalled only by the thrill it gives. Everywhere the granite massif

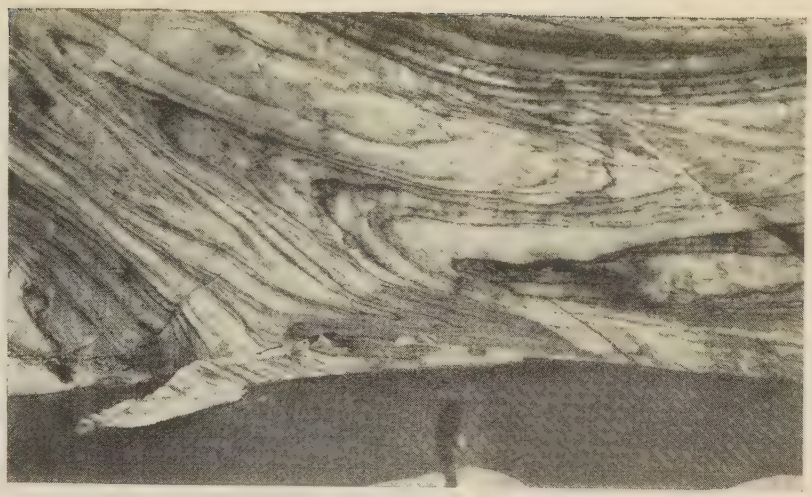
is gashed and slashed with gorges whose shadowy depths drop far below the line of sight. The snowy mountain peaks rise glistening in the sun above the craggy slopes whose ravines and buttresses, cirque-scalloped walls and gloomy canyons reveal the sculpturing of frost, stream and glacier through a thousand thousand years. And at our feet lies Grasshopper Glacier—our goal.

Like a gem it huddles in its north-facing amphitheatre, about a half-mile from front to back, and a mile or more from side to side. On this day—July 14—its steeply-sloping surface is mantled smooth and white with snow, and as we descend we feel carefully ahead, lest the innocent-appearing cover break to cast us into a crevasse. At most points the lower margin of the ice is snugly pressed against a moraine or great ridge-like heap of angular frost-riven blocks of rocks transported by the glacier; but to the east, the icesheet lies astride a rising ridge of rock whose crest forms a barricade directly in front of the glittering pack, and this ledge, which faces to the south into the direct rays of the sun, has radiated sufficient heat to keep the front of the advancing glacier melted back in the form of a curving vertical cliff of ice, fifty or seventy-five feet in height. From the top of the cliff projects a beautiful but treacherous snow cornice which warns one to beware how he tarries underneath.

So this is the façade—this ice cliff—to the vast mausoleum of banded crystal where lie preserved yet harmless the remains of countless hordes of devastating insects! Here is their resting place, to which they were swept by the storm winds from the plains, after stripping the grassy plains—these enemies of man!

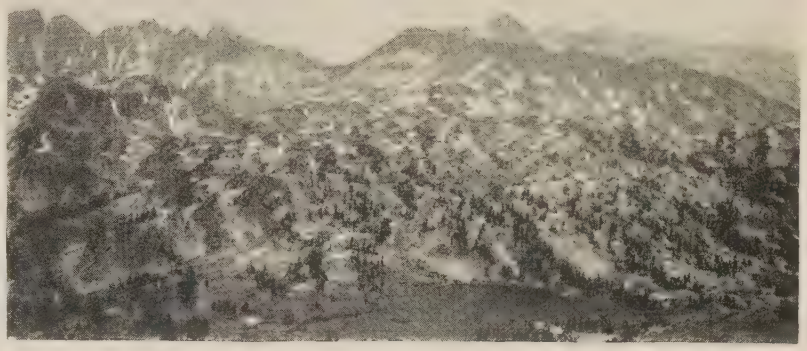
When the mantle of snow is off, the guide tells us, the surface of the glacier is covered with their remains. As the winds drove them helter-skelter among the peaks, the swarming clouds of insects were beaten down by hail or snow, and where they fell upon the ice, their bodies were preserved. Season after season contributed to the store. Each winters' snows buried them deeper. Thus they were entombed in bedded ice as securely as though covered with courses of masonry.

In places where the covering of snow has melted, we find a layer of dirt filled with broken wings and legs and other insect fragments, and the U. S. Bureau of Entomology, identifying the remains, explains that the forms are not extinct ones, but of the common migratory grasshopper, *Melanoplus spretus*. Fragments of a ground beetle of the family Carabidae are also found amid the frozen debris.



GIVING AN IDEA OF PROPORTIONATE SIZE

The crumpled beds of ice in the cliff above the glacial tarn. Note the man in the foreground



IN THE MIDST OF MOUNTAIN FASTNESSES

It was from here that the Frost King sent out his glittering glacial cohorts on their grinding way

EAST ROSEBUD LAKE AND THE CANYON

The trip to Grasshopper Glacier leads into country that every lover of the open trail will enjoy

Not just on the surface is the burying ground. Though efforts actually to dig out organic material from the lower part of the cliff were not wholly successful, the grasshoppers seem to be interbedded in ice from top to bottom of the glacier. Here, at last, the grasshopper is put in his proper place!

But, after all, the glacier itself is as wonderful as the insect forms it contains, and the ice-cliff as beautiful as the setting in which it lies. Rising above the mound of rock is a central mass of ice, the oldest part of the glacier, and resting upon its curved surface is a remarkable series of arching strata resembling an anticlinal fold in bedded rock. Close inspection reveals that these strata comprise two or more sets overlapping unconformably. These relations suggest a series of periods made up first of a considerable interval of melting, which reduced the glacier to a narrow central lobe with rounded surface lying astride the rock ridge, then an era of fattening by increased snowfalls, during which the glacial front advanced and overrode the curving surface of the older ice. At the time of our visit the latest surface developed by melting ice had been but recently covered by a mantle of clean snow. This new surface truncated the upturned edges of the ice strata on the flanks of the fold.

AND THEN THE GRASSHOPPER

Photograph of Melanoplus spretus, *the same species as material gathered from the Glacier revealed*

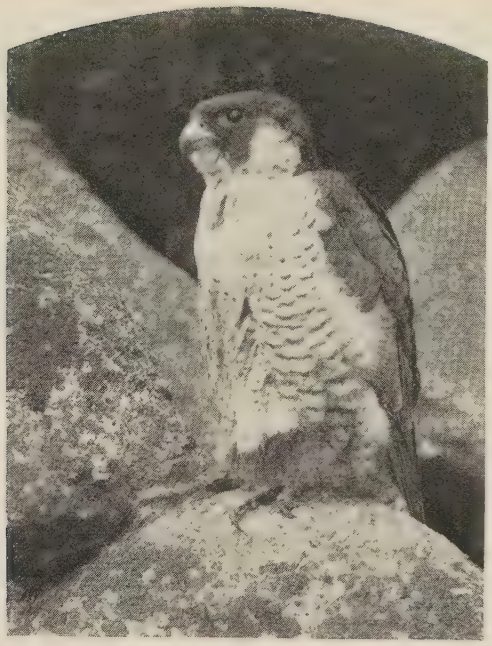
A short distance to the east, or left, of the rock mound the vertical cliff merges into a steeply sloping face revealing other unconformities. To the west, the feet of the ice-cliff are immersed in a glacial lakelet filling a hollow in the rock. A view of that part of the cliff above the water shows most remarkable contortions and overthrust folds in the ice strata, caused either by lateral crowding of the ice in overriding the central core of rock, or by unseen relations of the glacier to the hidden rock floor.

The sun drops to a glorious setting behind the gleaming ruby peaks of the Snowy Range as we ride the homeward trail. The glacial tarns turn blood-red, then saffron, then respond to the shining brilliance of star-studded skies. Back through the pine woods, to where the campfire gleams, and odors waft from the cook cabin at the journey's end. While behind us, nestling in the crook of the arm of the mountain, lies our Grasshopper Glacier, —a mighty, ghost-like form against the slope.

COURTESY NORTHERN PACIFIC R. R.

THE VIEW FROM THE GLACIER'S SURFACE

The rugged high country in which this fascinating phenomenon of the past is to be found by the visitor



THE FATHER AT THE NEST
The tiercel, as the male is called, after a bath and preening. The female, commonly known as the falcon, is famous as a huntress

MONARCH OF THE WILD
Such peaceful contemplation was infrequent during the days the young demanded constant feeding, and raiding trips kept him busy

A Bird *of the* Blood Royal

Photographing the Majestic Peregrine on English Shores

by Francis Heatherley

As they swept through the sky—the big black-backed gull rapidly gaining on the smaller peregrine—I could not help but think of them as a small powerful tug pursued by a large racing yacht. I suppose that the American analogy would be rum-runner chased by a Coast Guard cutter. Quickly the gull overhauled the peregrine, whether falcon or tiercel I could not tell. Then, with a few strong wing-beats, it climbed high over its intended victim. Like an attacking airplane it swooped, and seemed certain to smash its prey down into the sea by its powerful onslaught. But just then, the other bird, with no intentions of serving as a meal, made some invisible side-slip, and the gull shot yards below, shrieking with rage. Again it mounted; again it was foiled, and the peregrine continued its flight unconcerned.

Even before I had witnessed this incident which so well demonstrated the peregrine's sagacity and courage I had determined to photograph the bird in its eyrie, but afterward my admiration and interest were redoubled I had already pictured the raven feeding its young, and my other ambition—to be the first to "shoot" the golden eagle in its home surroundings—had been frustrated by H. B. MacPherson. But this bird, a famous member of the blood royal, whose ferocity, wisdom and hunting ability had given it a large place in the history of English sport, was very much worth the effort I knew necessary to study and picture it.

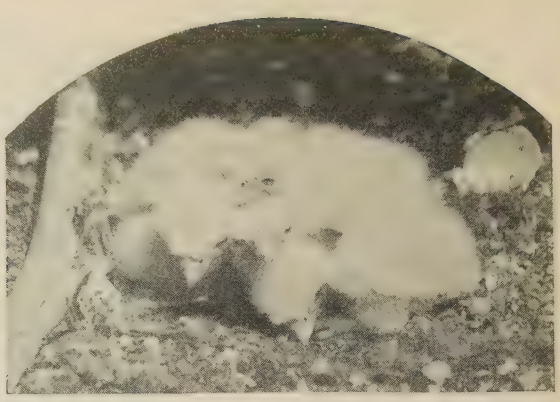
THE YOUNG CROUCHED IN THE EYRIE
What they really care about is a fat puffin or perhaps a razor-bill auk. They're eighteen days old

All over England I hunted for an accessible eyrie. People and peregrines have cooperated little with photographers. The first have a tendency to collect eggs and rob nests, and most of my letters were answered with a significant line—"robbed every year by egg collectors." The second chose rugged islets and bold shores meant not for human climbing. But at last I obtained permission to use that great sanctuary for sea birds, the Scilly Islands, and after days of vigorous hunting I found my eyrie, with the help of Mr. King, the resident photographer.

It was on a rocky islet, snug against one side of a

KEEPING AN EYE ON HIS FAMILY

The male stares at his brood, as if wondering how they ever got such mighty appetites



NOT SO VERY LIVELY, THANK YOU

Hardly forty-eight hours old, they show little of the adult ferociousness and courage

natural alcove formed by the rocks about twenty feet from the top of the precipice facing the sea. About four feet from the floor of the alcove it rested, for all the world like a small cage in a tiny room at the zoo. And what was more, it contained young birds, as the strange sounds we heard testified.

We passed up the opportunity to place the camera and the hiding tent directly in front of the nest, for fear the birds might desert, so erected it on the rocks above in the only place from which the camera could be trained down on the birds without disturbing them.

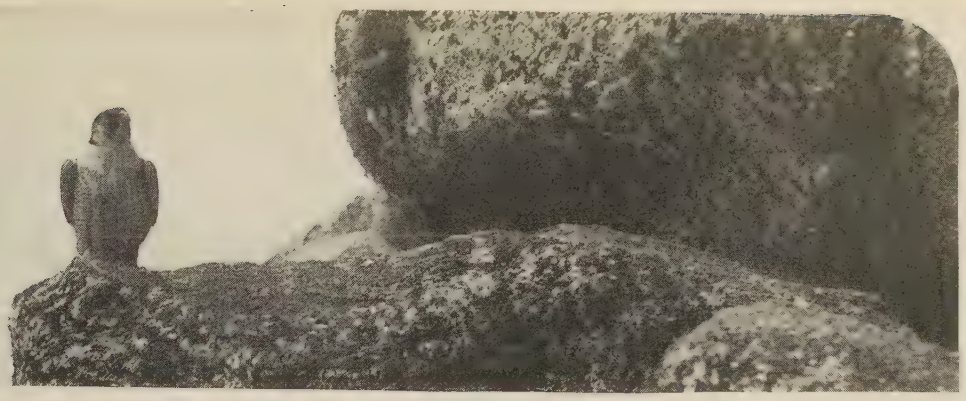
Then came days that tried the patience even of a Nature photographer. For several afternoons I waited, but saw more of the flies that buzzed about the eyrie than of either young or old. The young birds, paying no attention to the precept of that admirable hymn, "Work, for the Night is Coming", insisted on sleeping during the sunny hours, and I came to the conclusion that I, too, ought to spend the night in my blind to do away with the disturbing influence of my goings and comings.

At sunset, I found, the eyrie woke to life. The half-fledged young tottered about the nest whimpering for food. With their large eyes, prominent beak and downy legs, each looked like a caricature of Mr. Gladstone in white cotton shorts. Just before nine o'clock all eyes turned skywards, the whimpering increased, and finally the falcon alighted on a sloping rock with a puffin in her beak. She transferred the victim to her right foot and marched down the sloping rock to a point from which she jumped down among her youngsters. What a flutter of wings! They almost hid her, and when she next bobbed up, she had the dead puffin under her talons and was tearing lumps out of it for the babies. The meal lasted fifteen minutes, and then the female climbed on a nearby rock and gazed seawards with the imperturbability of a statue. A gory feather clung to her beak, the sole evidence of her meal. Her children whimpered close to her demanding seconds, but she kept her stare fixed on the moaning sea till the long twilight ended and darkness fell.

It was just three forty-five by my watch when I was awakened by the

THE MALE SHOWS HIS WINGS

He spreads out after a bath. (Inset) the falcon broods her fourteen day old young with that patience mothers everywhere show



WITH HER EYES ON THE OPEN SEA

With steadfast gaze, the mother peregrine watched the moaning ocean as night fell, while the young whimpered in the eyrie and the photographer grew more and more cramped

sounds of a meal. The male, commonly called the tiercel, had arrived with a razor-bill. I could not see the feast, however, because the entire clan disappeared under the rocks. Another puffin arrived at five and still another at seven, but still the youngsters whimpered for more. And then the adults went away to pursue their daylight hunting, and I tried to get the cramps out of my muscles.

I made several visits similar to this night vigil, but soon I discovered that though I obtained an abundance of interesting notes, the photographs were very poor, for the birds were so far away that they appeared on the negative the size of blue-bottle flies. I decided that we must risk it and try a blind in front of the eyrie, so Mr. King had a trestle made, and the hiding tent went up, almost touching the nest.

Then more hard luck befell us. Though we had intended to leave the tent unoccupied for two days to accustom the birds to it, a series of gales kept us from landing for an entire week. By this time the young were ready to fly, and though I could see and photograph the falcon on guard on a rock not ten feet away from me while her young were still nearer, yet I took no pictures because all the meals were consumed in the extensive sub-cellar behind rocks and out of sight of my camera. So, with that patience and resignation which a photographer must have and usually acquires I gave up for the season with the promise, "Just wait."

The birds had evidently disliked the canvas tent, which swayed, quivered and flapped in the wind, so I had a wooden shed made in sections during the winter, ready to place in the same spot should news come to say that the same eyrie bore another clutch.

The glad tidings came with the spring. Mr. King wrote that he had blue-pencilled four eggs. I hastened to the Scilly Islands. But this year, as the last, was blank. By hatching time two of the eggs had disappeared, so that the two young flourished with exceeding speed, and were ready to leave the eyrie all the sooner. The shed was a success but a new photographic shutter was not. Then to make everything ideally unsatisfactory, a series of gales gave us little opportunity to land on our islet. Again the peregrines had staved off publicity and pictured fame.

The third year told a far different story. A full clutch of eggs was reported, and Mr. King and I invited several ornithological friends to join us so that the eyrie might be kept under observation day and night. For three weeks we watched, and the notes and photographs piled up.

It was well worth the days of waiting and the cramped hours in our little four-foot-square hut to watch these birds of the blood royal and their young. Others had noticed that the young differed considerably in size, and laid the cause to the fact that the eggs were not laid

ABOUT TO LEAVE HOME

A group of the young ready to try the flightways. (Inset) The father appears to be lecturing, but instead is feeding, his four day old young

all at once. We proved, however, that the difference was sexual in nature, and could be traced back to the egg, which is about 60 grains heavier in the female.

It was all we could do to keep from rocking with laughter at times when we watched the young trying to feed. Even when newly hatched they were generally given two or three mouthfuls of feathers at the beginning of each meal—probably a sort of *apéritif*. Then usually two chicks would manage to grab opposite ends of some choice morsel and engage in a tug of war. Once we saw a female but four days old receive the entire leg of a thrush which, after manifold struggles, she settled down to digest with the claws and an inch of the tarsus still outside her mouth. Two hours later there were no portions visible except when she gaped.

The prize incident of all occurred one day when the tiercel, as was his custom, was yapping at the young to take the food. I accidentally knocked over a tobacco tin, and the proud father stopped, with open beak, to listen. The youngster, spying what he thought was a succulent morsel, darted into his parent's mouth, seized his tongue and did his best to pull it out, while the pained paterfamilias flapped his wings and shrieked dire imprecations. Finally, after dragging the resisting youngster all over the eyrie, he managed to get loose. One would have expected the bird version of the local wood-shed to be then dramatized, but no—the meal was quietly resumed.

It had taken three years to study my peregrine, but it was worth it, and I felt pangs of regret when I finally took leave of these ferocious birds, so unsuspecting of the way their portraits were to be spread abroad. I wondered how long the eyrie would be left in peace if it were placed anywhere but on the Scilly Islands, where they have a way of really defending rare birds' eggs. Genuine British eggs are worth five pounds a clutch in the market, and many are the collectors. Then, too, the peregrine, despite its proud history, belongs to that aristocracy of the avian host, the birds of prey, who receive none too adequate protection in the British Isles. It often fares the fate of the stoat and the hawks of all kinds who are killed because their presence will ruin the day's drives. But bird values are undergoing re-adjustment and the time is approaching when the sight of a pair of buzzards, wheeling on high with outstretched wings, will be considered worth many a young rabbit. And then the peregrine will probably come back to its own place, won after centuries of serving lovers of sport.

HISTORIC GREAT FALLS OF THE POTOMAC

HAROLD GRAY

A close-up of the Virginian falls, which clearly shows how vital to its beauty is the heavy flow of water a power company is seeking to divert against the people's wishes

NO BILLBOARDS TO MAR THIS LANDSCAPE
Kamehameha Highway on the Island of Oahu, one of the hundreds of miles of paved motor highways, all free of outdoor advertising

BILLBOARDLESS HAWAII

Where a True Value Is Placed on Natural Beauty

by John Edwin Hogg

SOME years ago much of the incomparable scenic beauty of the Hawaiian Islands began to do what the scenery of other regions has done and is still doing. It was disappearing behind an ever-increasing number of garish billboards which interrupted lovely vistas of mountain, turquoise sea, and tropical vegetation. The erection of billboards in Hawaii progressed to the point where a group of women known as The Outdoor Circle began to get "huhu" (angry) about it. Today there isn't a billboard on the Island of Oahu, the island on which Honolulu is located; and to the writer's knowledge, there isn't a billboard on any other island of the Hawaiian archipelago.

The purging of Hawaii of billboards came about as the majority of orderly and permanent reforms are accomplished, by the creation of a majority public sentiment in favor of billboard elimination. And, as in the case of other reforms, things had to get too bad for public toleration before steps were taken to make them better. Just as the fraudulent and money-grabbing practices of certain food and drug dealers gave us a Federal food and drug law, and as the evils of the old-time liquor industry brought about the prohibition experiment, Hawaii got rid of billboards when those unsightly structures fell from public grace. The story of how all this came about is not only interesting, but one from which other regions afflicted with billboard eyesores may draw some valuable observation.

The billboard business in the islands was legitimate and prosperous until about 1922. Billboards had begun to crowd out quite a bit of scenic beauty, but the billboard advertisers were convinced that billboards did help them sell goods, and nobody other than the good ladies of The Outdoor Circle seemed to be particularly interested in the preservation of Hawaii's natural grandeur. The Outdoor Circle began to make considerable "noise" about the desecration of the islands by unsightly billboards, but at that time the organization did not represent any power sufficient to make its protests effective. The number of billboards steadily increased, and so did the membership of The Outdoor Circle.

Before the digging of the Waikiki reclamation canal took the water off of a large portion of what is now known as the Waikiki section of Honolulu, much of that region was a vast salt marsh, commonly known as "The Duck Pond". A representative of a food products

manufacturer got his eye upon it. To him it was a dandy place for a huge billboard, because tens of thousands of people passed by it every day in motor cars or on street cars. A tremendous billboard straightway made its appearance on piling in the middle of the marsh. This was the beginning of the end for all billboards in Hawaii.

The ladies of The Outdoor Circle, by that time greatly augmented by the strength of increased numbers, arose in righteous wrath. They announced through the press that they would not patronize the products sold by billboard advertisers. They pressed their campaign so vigorously that billboard advertisers began to find their billboard advertising detrimental to their business interests. A wholesale pulling down of billboards and cancellation of billboard advertising space immediately followed.

At that time practically all the billboard advertising in the Hawaiian Islands was in the hands of a single firm, The Pioneer Advertising Service. So, the ladies of the Outdoor Circle took up a public subscription, and purchased the Pioneer Advertising Service entire. The terms of the sale, however, were that the business was to be junked, and that the former owners who sold out agreed not to re-engage in the billboard business—at least, not in the Hawaiian Islands. Simultaneously, notices were sent to mainland American and foreign advertisers to the effect that all billboard advertised products stood little chance in Hawaii. Today, a billboard advertisement would be tantamount to a public notice that the purchase of goods so advertised is "tabu". Still there is no law against billboard advertising in Hawaii, although there is a well defined public sentiment against it, which is law enough.

THE NEAREST THING TO A HAWAIIAN BILLBOARD
A water tank disguised as a pineapple making a symbolic and pleasing effect

After having sunk the billboard issue so deep that no one dares attempt its resurrection, the women of the Outdoor Circle turned their attention to the cultivation of Hawaii's natural scenic beauty. They have since planted out tens of thousands of coconut trees, hibiscus plants, oleanders, pink and yellow shower trees, poncianas, and such, which now bloom over every landscape. Wherever one would normally expect a billboard to be there is usually a bower of flowers, or a blaze of floral color framed against coconut palms, and with the blue sea or the vivid green of the mountains beyond.

Aside from sugar and pineapples, the two major industries of the islands, Hawaii's third industry is that of catering to tourists. According to the figures of the Hawaii Tourist Bureau—somewhat conservative—Hawaii's tourist business last year was worth $10,000,000. The connection between tourists and billboards—or the lack of billboards—is not readily apparent. California is literally disfigured with billboards and all sorts of unsightly advertising schemes carried on out of doors. Yet California has an annual tourist business that dwarfs Hawaii's by comparison. But California is on the mainland of the United States, while Hawaii stands all alone away out in the middle of the Pacific Ocean.

Hawaii might be festooned with billboards, and all the billboards that could be assembled wouldn't bring a tourist from overseas. A group of Hawaiian Islands plastered with billboards might create a little local business but it would be nothing compared with the value of the tourist patronage. Climate and natural beauty, plus an assortment of volcanoes, and other strange things, constitute Hawaii's sources of tourist attraction. Billboards could add nothing, but would detract much from those attractions.

Innumerable Hawaiian business enterprises, whose owners have been interviewed by the writer, have experienced no decline of business in any way attributable to the lack of billboard advertising mediums. Those businesses are now advertised in the newspapers, by street car cards, and direct mail campaigns. Business men declare that such advertising, which offends no one, brings in the business, and that they have no desire to return to the old regime of attempting to out-advertise their competitors by the purchase of billboard space even though possible. They recognize that Hawaii's lack of billboards is one of the latchstrings hanging out to the tourist from overseas. A few billboards probably wouldn't do any serious damage to Hawaii's tourist trade, any more than billboards keep tourists out of Southern California. But, the Honolulu business man is inclined to believe that billboards are an imposition upon tourists and local residents alike, and will have none of them. It is

A SPOT THAT WOULD MAKE AN EXCELLENT BILLBOARD SITE
It is one of many spots in Hawaii but no billboard will be erected upon any of them because it would not pay

better business for him to open his purse to a solicitation for funds for a few more flowering trees, coconut palms, or other additions to Hawaii's beauty and attractiveness to the tourist.

Time was when business houses in Honolulu painted their names across the sides of their buildings in glaring-hued letters twenty feet high. Today there isn't a sign of the sort in Hawaii. Business firms vie with each other in the creation of establishments that are dignified and attractive in appearance. The best shops look more like banks or city offices than they do places of retail trade. Gold leaf letters on plate glass usually announce the name of the firm and the kind of business in which it is engaged. Some outside signs are used in the business districts of Honolulu, but the vast majority of them are small and inconspicuous compared with the garish signs one sees in nearly every other American city. A few small electric signs are used, and some painted or enameled signs are floodlighted at night. But, on the whole, it may be said that Honolulu's entire scheme

HAWAII HAS SELECTED THESE SUBSTITUTES FOR BILLBOARDS
Thousands of flowering trees, hibiscus and coconut palms have been set out to add to beauty instead of destroying it

of outdoor advertising is remarkably quiet, and dignified.

The present program of municipal beautification in Honolulu is now taking the form of getting rid of overhead wires and poles. Poles and wires are being eliminated all through the city by the substitution of underground conduits. In this matter the advocates of outdoor beauty have a silent ally that works in the dark. This is the wood-consuming termites that destroy telephone poles, sometimes in as short a time as nine months. Naturally, that tends to favor the elimination of poles, and the placing of wires in lead-armored conduits underground as rapidly as the costly work can be accomplished.

A TREE-BORDERED STREET IN HONOLULU
Hawaii's citizens realize how her flowers have advertised the islands and will stand for nothing that will ruin their beauty

There is a magnificent business opportunity in Hawaii for the inventive genius of anyone who can devise outdoor advertising methods for use in the islands that will not be offensive to public taste. A splendid example appeared recently on top of the plant of the Hawaiian Pineapple Company, Ltd. in Honolulu. It is a steel water tank in the form of a huge pineapple—the symbol and conventional gift of welcome throughout the South Sea Islands, as well as the trade mark of one of Hawaii's greatest industries. This pineapple water tank is the nearest thing to an advertising billboard to be found in Hawaii today. Yet, it is not a billboard, offends no one because of what it symbolizes, and is more pleasing to the eye than an ordinary steel water tank would be. Specialists in outdoor advertising would do well to prospect that subject, not only for possible application to uses in Hawaii, but wherever outdoor advertising is threatened with being tumbled from public grace by reason of its own abuses.

That all the business and investment represented by all phases of outdoor advertising is so threatened is already in evidence in many parts of the nation.

It is not inconceivable that the elimination of billboards as it has been accomplished in the Hawaiian Islands may be accomplished elsewhere. Prohibition really started in Kansas, and the liquor interests "poo-poohed" the idea of its ever becoming a national law. By the same token, prohibition of billboards in Hawaii by public sentiment is an accomplished fact, and any other region that objects to such distraction of its beauty can apply the same remedy to obtain quick relief along such lines.

NO GARISH SIGNS OR BILLBOARDS HERE
Honolulu business house which sells everything from salt shakers to threshing machines but can be good-looking while doing so

A VENERABLE BISHOP PINE
It has seen the passing of many years and its wisdom would be like unto Solomon's

TREE FRIENDS *of* MINE

Their's is a Companionship, Mute but Understanding

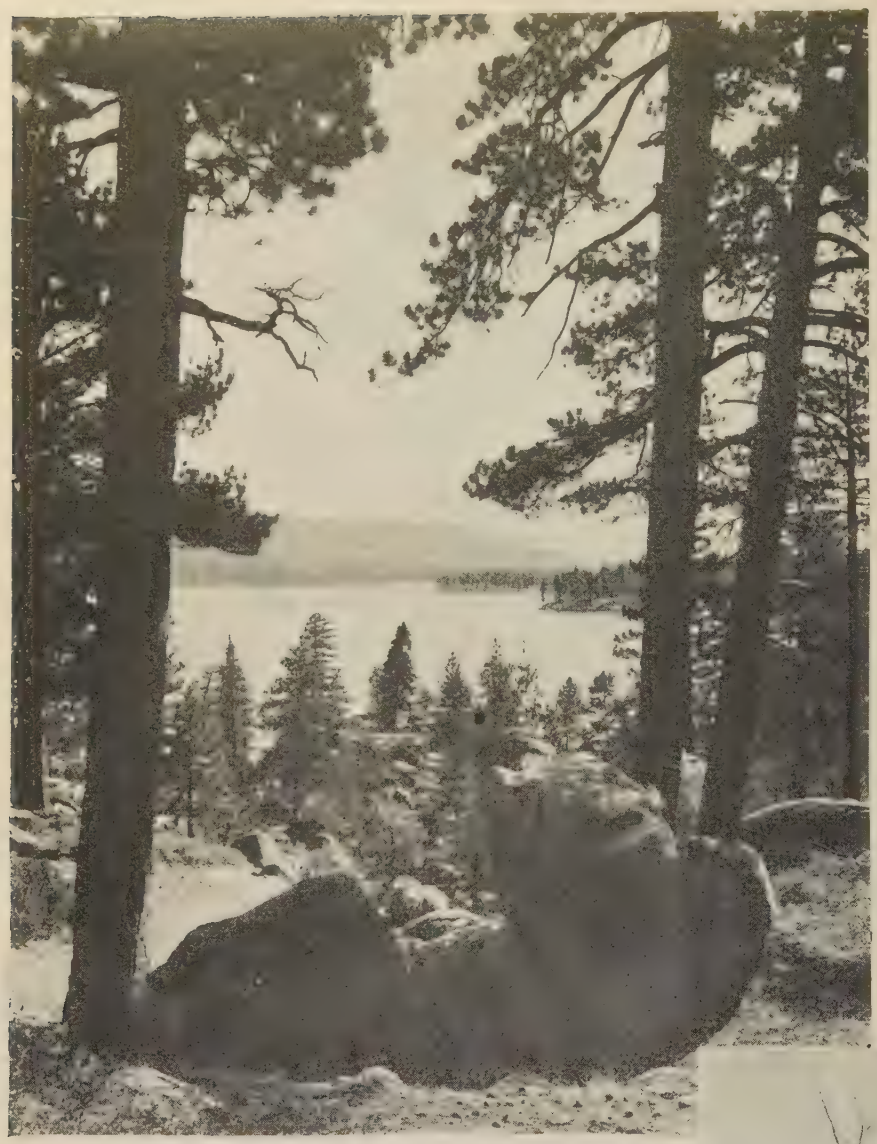
by A. Brazier Howell

WE ENJOY the fleeting companionship of birds, bees, or four-footed companions but my feeling for trees is deeper. Prairie and desert have their own enchantments, but let me have trees and there I find companionship besides. They never intrude but are peaceful, soul-filling.

I think of trees as human beings, each with its own individuality and character. Young timber is interesting but straight young saplings lack character and are like schoolboys—full of promise but as yet unformed, unstable. To only a somewhat lesser extent is this so of man-planted trees, or those man-tended. A park tree resembles the typical figure of a man of great wealth—well-groomed and polished, the suave exterior concealing a soul we cannot fathom, whether good or evil. But in the forest the old tree shows the scars of its battle with life, like some kindly old mountaineer, his story told by his rugged features and his simplicity. My favorites are the old fellows, with autobiographies writ upon their gnarled limbs for all to read who know their language. I like to seek them out and visit with them as old friends; place my hands upon their sturdy trunks, with a word of understanding as one would converse with a faithful dog; bide a while with them and draw strength from their nearness.

We know that trees are wakeful during the day and rest at night, but rather would I look upon them as drowsing the days away, basking silently in the sunshine and awakening with rustling branches when the shadows lengthen, to whisper together in the moonlight and watch with kindly tolerance the activities of all the little forest dwellers that rouse at the coming of darkness.

I have scattered tree friends of a particularly intimate



TREES THAT GUARD THE LAKESIDE
Or the juniper of the upper levels that has fought always for its life—these are real friends

nature—patriarchs all—in many distant spots, and wish to think they desired to guide my younger footsteps in wise paths of inward happiness and teach me something of their tolerant philosophy of life. A visit to one of these lends me strength and contentment. Most of them are conifers, for these have a serene dignity usually lacking in their deciduous relatives.

One old favorite has her being in a deep canyon of the Santa Rita Mountains. She is a venerable and immense juniper whose ample waist my outstretched arms will scarcely a third encompass. A mother of ten thousand children, carried near and far by her feathered intimates. Her home is a sheltered bench along the stream, uncrowded save by neighbors of lesser importance, and her peaceful life in the golden Arizona sunshine has given her with the rolling centuries a dignity and comfortable symmetry like unto a good-humored woman, sitting in a sunny corner and waxing round with the passing of the years and the gleaning of wisdom. In her patient shadow a friend may relax and muse the hours away with a vast and soothing contentment.

Far up on a granite shoulder of the Sierra lies a great boulder, riven asunder by the help of frost and an ancient white-barked pine, wedged in the fissure as if to brace himself against the bitter gales. No giant this, for he is beaten down and stunted by his tribulations and the wresting of a living from his inhospitable homestead, his old joints gnarled and twisted as any other aged mountaineer. His girth at this altitude bespeaks a ripe maturity of many, many times three score years and ten, and his hoary hide is scarred by lightning. One can trace his struggle from the time he first thrust up through the rubble, confident of his strength to battle with the everblowing hurricane of the high ridges. Vanquished he had been in body but not in spirit, and the wisdom of his long life had taught him to bend before the unbeatable strength of his adversary and to compose his old bones where was the most comfort. His locks are few and weatherbeaten but his wide-braced feet are sturdy, as he has crouched in the blinding storms of winter, hugging the anchorage of his crevice with the snows packed tight about him. His only friend is a white-tailed jack rabbit who spends the days beneath the matted canopy of low hung foliage which protects him.

I, too, once crouched in his lee and the rock was warm at my back in spite of the mountain chill. What had he not seen in a long life, this new found friend who in his lonely corner had known man only at a distance until I had sought him out and slapped his flank with a kindly hand? At his feet lay the backs of the lesser ranges crowded in the shelter of the main cordillera as if for protection, and farther, the upthrust of the morainal rubble hills, in the distance like giant gopher mounds, standing guard on the low country—low as of the uttermost pit from the lofty perch in the keen sweet air of the top of the world, but still thousands of feet above the sea. When the eyes of my friend were keenest, before they were blurred with the rheum of age, he had seen the smoke from the emigrant trains far over the valley, and later, the tiny, futile figures of prospectors pecking away at the everlasting hills in the hunt for gold, striving for inevitable despair. A chipmunk, a rabbit, and an eagle, and a scattered handful of rosy finch waifs drifting before the first snows of autumn—that is all. Looking endlessly, inscrutably out over a pygmy world in eternal solitude.

Time was, long, long centuries ago when the Torrey pine and the Monterey cypress flourished over great stretches of California country, marshalled along the sea coast and crowded up to the foothills. But they were ill equipped for a death struggle with a pitiless force of Nature—increasing aridity—predestined to be the relentless victor. The pine is not prepossessing—a grubby sort, with scant, thirsty-looking foliage and gnarled arms undignified by size—an anæmic tree with scant appeal to our fancy save for its brave, hopeless struggle. It has beat a slow retreat to the place of its last stand where with man as its ally it can withstand the siege for a few score years. Trees can give us sadness only when foredoomed to death, like a loved one ravaged with an incurable malady. So does Nature sometimes assume the rôle of destroyer of a nation of trees, yet there has been fair play. The trees have had their chance and after brave struggling have been honorably vanquished. Trees never surrender but battle valiantly to the last and when they must perish of long thirst a host of little sun-plants troop in to serve as their monument and keep their memory green from season to season.

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IN THE CATHEDRAL THAT IS THE REDWOODS

For the lover of trees there is no more lovely or sacred sanctuary than among these ancient giants

Our tree friends may be of those still virile, or we may pay homage to one who has passed on, as we would visit the resting place of a lost companion and offer tribute to a friendship greater than death. Just as we can render honor to a hero enshrined in the hearts of a nation but who ceased life before our time, so can we feel toward a great tree that has fallen in the long ago.

In such manner I like to visit a forest friend that never knew me and whose memory has passed from the ken of living men. In the heart of a great redwood forest, whose standing files are each, like ranks of closely packed worshippers in a cathedral, too impersonal and similar one to the other to inspire any feeling of individual intimacy, there is a rarely beautiful rill, tumb-

ling from up the gulch in miniature cascades, skirting mossy stones and coyly darting under roots, only to reappear with a chuckle as though flirting with the prim trilliums above. A deep pool gives pause to the stream, its banks on one side crowded with stately sword ferns in huge array while on the other a dell and dark, sheer slope are solid with maidenhair, each frond of noble breadth, while the whole is embowered in bloom and delicate green tracery of cool, crisp growing things. Above, stretching from high bank to bank, is the mighty form of a prone giant. A hoary old redwood had crashed to earth long, long years agone. No premature death had been his, but after mellowing through the centuries and gathering the measure of a full span of life, this patriarch had encompassed his allotted time, and like a wise old centenarian in the midst of his children, themselves grown old, had passed to the bosom of his forefathers. Nigh forty feet in girth he measured and a great dignity was still his as he lay, bridging the stream over which he had watched. As he had been deliberate in growth, so was he slow in returning to the earth from which he sprang with the eagerness of youth.

In death he had given life, for from his form, high above my feet, sprang sturdy trees with roots braced to earth on either side, themselves timber of respectable size but dwarfed to the proportion of saplings amid such surroundings. High-bush huckleberries, gay with scarlet fruit, were also upon his back, and a verdant carpet of lovely redwood sorrel and wake robins covered him as a robe.

With a stick I pierced the deep armament of rotting bark, and then probed a scant three inches of pithy wood. He had so lain for perhaps a hundred years, but his heart was as stout and strong as it had been throughout his life, and so it will remain long after I, with my children, shall have joined his spirit in the celestial forests. But with what courage he lies, his former place yielded, yet still offering service to Nature's children.

FACING A NEW WORLD

After seventeen years in the earth, he creeps forth to perpetuate his breed, and shrill in the tree-tops

THE MIRACULOUS CHANGE

The discarded pupa case is at the right, and the cicada, just drying off, at the left. Soon he will take to flight

THE CICADA'S RESURRECTION

He Waited Seventeen Years for This Moment

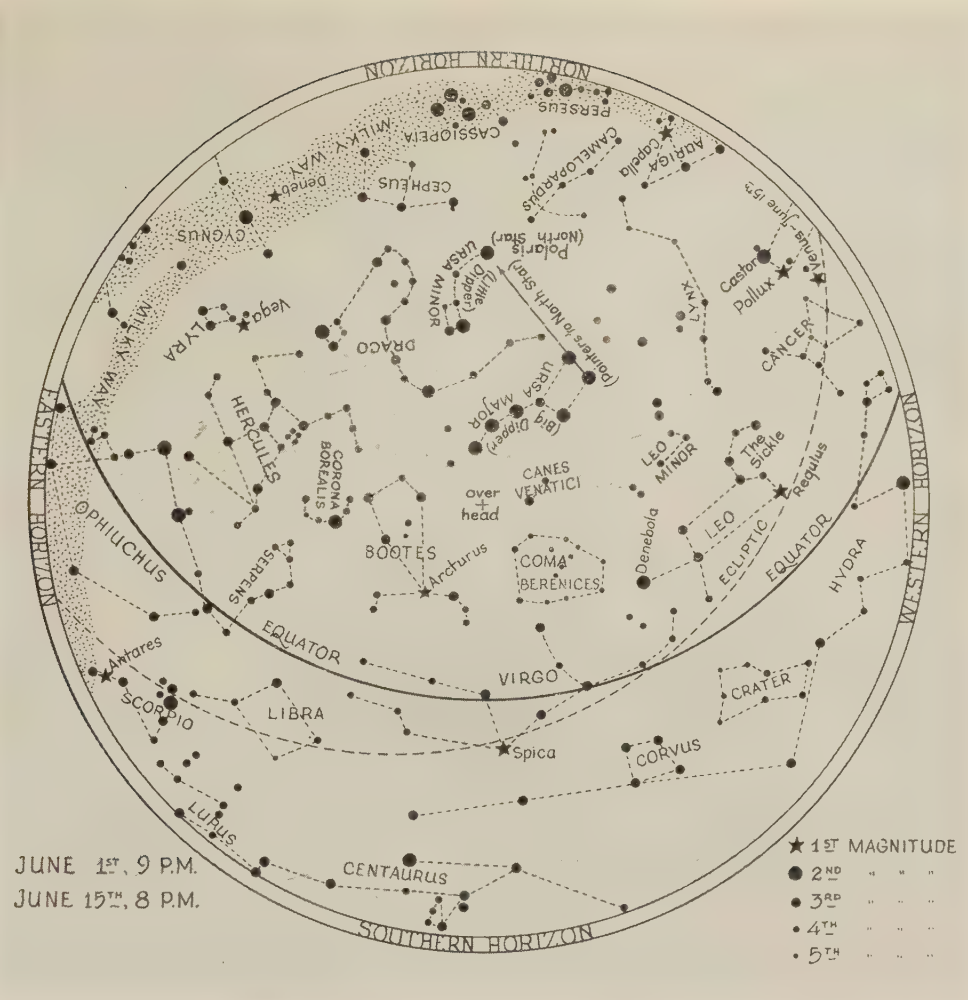
by George T. Hellman

HE WAS just one of those little brown things one often sees creeping along the ground while walking along some brook or through the woods. Stopping to examine it, I recognized the little fellow as being a cicada, newly come from the depths of the earth. He looked old and wrinkled, and, if entomologists are right, he was seventeen years old. During those years he had lived a sub-terrestrial life, and after the long wait, this particular evening was the one chosen to come forth and explore a world that was very strange to him.

His actions were a little mysterious and, feeling that something was about to happen, I lifted him carefully and placed him on a stump in the moonlight. Very soon something did happen. The brown shell, or pupa case, in which he had lived so long, suddenly split up the back and, with many squirmings and contortions, there emerged through the opening a pair of eyes and a triangular head. The process was slow, but after about ten minutes there were three pairs of legs tugging feebly at the bark of the stump. A pair of dwarfed and crumpled wings soon drooped over the side of the pupa case, all moist and shiny, but, like the legs, they showed signs of activity, and weakly vibrated in the evening breeze. During the next ten minutes the old brown suit was cast off and he was moving across the stump.

The change that was now taking place in those crumpled little wings was truly marvelous. They actually seemed to grow as the body juices flowed into the tiny veins, and the vibrations became more violent. In the next few minutes they stretched their full length, still limp but ready to be hardened and dried by the warm air of summer.

Something marvelous had surely happened. The combination of beauty and helplessness shown by the little creature at this stage affords a wonderful sight. The color is a creamy white, with two contrasting patches of black on the prothorax, and a tinge of orange at the bases of the wings. The movements are slow and uncertain, with little of grace. Now he has successfully lived through his early stages of development and has become a full-sized adult, he has only to wait for the warm air to harden his wings and to darken his virginal tints. For a few days he will fly about the tree-tops with his fellows shrilling his strange, wild song and enjoying to the full a life untrammeled, free even from the labors of food-seeking. Then, having provided for the continuation of his race in the brood that for another seventeen years must dig and delve in the seasonless depths of Mother Earth, he will yield his body as a contribution to her life-giving mold, or for the sustenance of others.



To use this map hold it before you in a vertical position and turn it until the direction of the compass that you wish to face is at the bottom. Then below the center of the map, which is the point overhead, will be seen the constellations visible in that part of the heavens. It will not be necessary to turn the map if the direction faced is south

The Trans-Neptunian Planet

What of the Newcomer to the Family?

by Isabel M. Lewis

The discovery of a new planet far beyond the orbit of Neptune did not come as a great surprise to the astronomical world for its existence had long been suspected and its discovery was not a happy accident but a result of organized search. Yet it seemed remarkably fitting that this discovery should be made at the Lowell Observatory dedicated by its founder, Dr. Percival Lowell, to planetary study and research and that it should be announced on the seventy-fifth anniversary of his birth. It was also a happy fact that the photographic plate on which the planet was first seen as a tiny speck by a member of the observatory staff, C. W. Tombaugh, was taken with the huge telescopic camera the 13-inch lens of which was presented to the Lowell Observatory to be used in a search for the planet by Dr. A. Lawrence Lowell, brother of Dr. Percival Lowell and President of Harvard University.

In the year preceding his death in 1916 Dr. Percival Lowell had published a memoir on The Trans-Neptunian Planet in *Memoirs of the Lowell Observatory,* Vol. 1. This memoir was made the basis of the search for the new planet at the Lowell Observatory. In it he had correctly predicted the approximate distance and size of the planet and the constellation in which it would be found. The calculations upon which his predictions were based were similar to those employed by Leverrier and Adams in their prediction of the position of Neptune. These depended upon the perturbations produced in the motion of the planet Uranus by an unseen body. In the case of Neptune they were large and pointed clearly to the unseen disturber but the new planet is so far from Uranus that the perturbations that it produces in the motion of Uranus are only about one twenty-fifth as great as those pro-

duced by Neptune. The calculations, therefore, became far more complicated, and Dr. Lowell's task was far more difficult than that of Adams and Leverrier.

The actual discovery of the new planet was made some weeks before it was announced, and it was carefully observed by members of the Lowell Observatory staff for many days visually and photographically to make sure of its planetary nature. It was announced to be at a distance of about 45 astronomical units from the sun. The astronomical unit is the distance of the earth from the sun or about ninety-three million miles. Neptune is at a distance of 30 astronomical units or about 2,800 million miles from the sun. The new planet is then about 4,200 million miles from the sun and its diameter is said to be about twice as great as that of the earth or 15,000 miles. It is too distant to show the characteristic planetary disk in the telescope and is merely a tiny point of light of the fifteenth magnitude giving only one millionth of the light of a first magnitude star. It is just about at the limit of visibility of the 26-inch equatorial of the U. S. Naval Observatory in Washington with which the satellites of Mars were discovered but was found on the first night on which a search was made for it by Astronomer H. E. Burton. The observations were difficult to make, however, because the planet is now located in the path of the Milky Way a few degrees southwest of the first magnitude star Beta Geminorum, or Pollux.

The planet was also found photographically at the U. S. Naval Observatory, on the same day that it was seen visually, by Dr. G. H. Peters and his assistant Mr. N. E. Wagman. Other observatories that reported observations of the new planet shortly following the announcement of the discovery were Yerkes, Heidelberg and Neubabelsberg.

The question of a name for this latest addition to the sun's family promises to be an interesting one. Among some of the names already suggested are Lowell, Percival, Minerva, Erebus and Pluto. It is usually customary for the discoverer of a celestial body to name it but it has been reported that Dr. V. M. Slipher, Director of the Lowell Observatory, has stated his intention to ask the American Astronomical Society to vote upon a name for the new planet subject to the approval of the Lowell Observatory. The first "discovered" planet Uranus was long known as "The Herschelian Star." The name proposed by Herschel himself was "Georgium Sidus" in honor of the king. By this name it was long known in England but the suggestion of the astronomer Bode was finally adopted and the planet's name was changed to Uranus in accord with the custom of selecting names of Greek or Roman deities for the planets.

Of the three discovered planets Uranus is the only one visible to the naked eye and it is just at the limit of visibility. It has the appearance of a faint star of the sixth magnitude with a perceptible disk when viewed telescopically. It was discovered by the elder Herschel on March 31, 1781, when after a return from a concert, he was sweeping the heavens for interesting objects with a seven-inch reflector of his own make. He thought at first he had discovered a comet and did not suspect it was a major planet. A year passed before its true planetary nature was revealed as a result of the calculations of its orbit by the astronomer Lexell.

The planet Neptune is invisible to the naked eye but may be seen with a good field-glass as a faint star of nearly the eighth magnitude. In large telescopes it shows a greenish disk. Its discovery, the honor of which was generally acknowledged to be due to Adams and Leverrier equally, since each contributed to it through independent calculations, has been proclaimed to be the greatest triumph of mathematical astronomy. The visual discovery of the planet with the telescope was made by Johann Gottfried Galle, a young assistant at the Observatory of Berlin, as a result of a communication from Leverrier which said in substance "Direct your telescope to a point on the ecliptic in the constellation of Aquarius, in longitude 326 deg., and you will find within a degree of that place a new planet looking like a star of about the ninth magnitude, and having a perceptible disk." Galle found the planet on the night of Sept. 23, 1846 within one half hour of the time he began to search for it and within less than one degree of the predicted place.

The new planet discovered at the Lowell Observatory was also found as a result of a search following upon a prediction. It also was on the ecliptic in the approximate region predicted and of nearly the predicted size and distance. Astronomers recognize the fact that there is no reason why there may not exist other planets exterior to the orbit of Neptune, some of which indeed may be so small and so distant that it will be impossible for human eyes to see them even with the aid of the most powerful telescopes in existence. It is possible to say, however, that within two and a half times the distance of Neptune from the sun no planet as large as Jupiter could exist without so seriously perturbing the motion of the planets Uranus and Neptune that its discovery would be certain. Since the date of its discovery Neptune has completed barely one half a revolution around the sun. The length of its year is equal to 164 of our years and that of the new planet nearly 300 years. In the future the gravitational pull of other distant planets may be indicated by irregularities in the motion of Neptune and the new planet and lead to the discovery of other worlds now unknown, just as perturbations in the motion of Uranus have led to the discovery of Neptune and the new planet. It is possible, moreover, in the meantime that a happy accident or systematic search among the zodiacal constellations may lead to the discovery of one or more additional planetary body.

In its slow majestic swing around the sun in the frigid depths that lie beyond the orbit of Neptune is the newly discovered planet attended by one or more satellite worlds? Uranus has four satellites, Neptune one. It is hopeless to expect to detect a satellite of the new world, even if there is one, unless it should be comparatively large and massive in which case it might possibly be detected by a powerful telescope.

At the distance of the new planet from the sun no planet interior to the orbit of Neptune, nor Neptune itself, would be visible to unaided vision and even with telescopic aid it would not be possible to find the tiny little objects which represent Mercury, Venus, Earth

(Continued on page 405)

For A Gorgeous Garden—Tulips

MANKIND'S fancy has always been captivated by colors. Whether in paintings, rugs or flowers, it is color that catches the eye. And among flowers, few bring us as gorgeous colors in as wide a range as do the Tulips.

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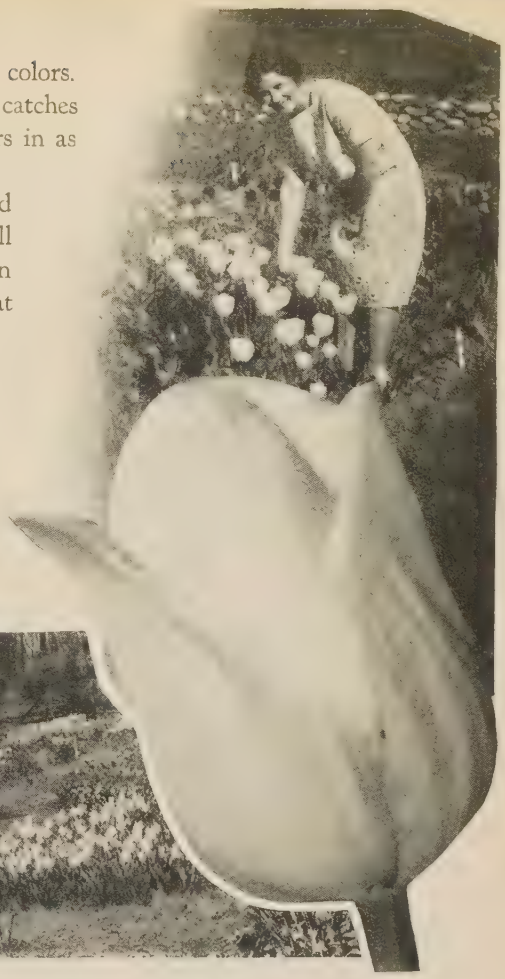

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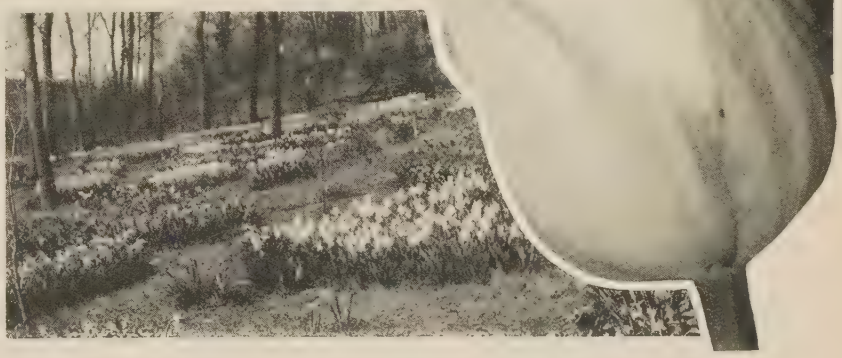

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FROM RIM TO RIM

(Continued from page 366)

All this in half an hour. Something to store away in the picture book of one's visual memory. And from it we dragged ourselves to the mundane business of food and bed rolls to prepare for night on the brink of the Grand Canyon.

With the morning we were away by auto to meet Supervisor Mann of Kaibab National Forest and with him to talk deer problems, and many things about the region. He was waiting for us by the roadside and led us to Dry Fork Ranger Station, where was one of many test plots, fenced against the deer. Within the fence trees and shrubs grew strongly; without, hardly a living shrub was in evidence. This plot demonstrated that the deer bite off the buds of the yellow pines and so strip every young aspen that it has no chance. We passed several such plots in different types of woodland and the same sort of result was evident.

After a stop for lunch we drove on, coming finally within the winter range of the deer. We left the yellow pines in favor of pinons and junipers, and, at last, sage brush. The situation here was bad. There had been plenty of rain during the summer, and therefore good grass and plenty of mushrooms for the deer in the high country. But when snow came and drove the deer to their winter range they would find it much as they left it in the spring. Even the juniper trees were shaped like large umbrellas—every green leaf having been stripped off as high as a large deer could reach standing on his hind legs. One of the favorite foods of the deer is the rock-rose, one of the desert shrubs with minute evergreen leaves. Acres and acres bristled with gray prongs, almost completely dead. There was almost utter devastation. Yet this country would be called upon to feed deer again within a month or two.

The Park Service and the Biological Survey, Mr. Mann said, now agree that reduction of the herd is necessary to a point where a maximum limit can be set and maintained until the range shall have recovered sufficiently to assure adequate food. Our visit to the Kaibab Forest was thorough and enlightening from the wild life and conservation point of view, and we obtained a complete picture. It was growing dark when we said goodbye to Supervisor Mann and set out for V T Ranch for dinner and for camp for the night at Jacob's Lake Station.

After a crisp, cold night and a gorgeous sleep in the open, we cruised down the road nearly to Jacob's Lake. Two of the beautiful and rare Kaibab squirrels ran across the road. These unique tassel-eared, dark gray squirrels, with pure white tails, are found nowhere else in the world. Cautiously I set up my camera. The squirrels did not run away as long as I moved slowly. I tried to focus on them but they kept working farther into the woods. Mrs. Pack tried a large circle hoping to drive one back slowly but she lost him and we lost heart until a cone dropped from a tree directly above us. On an upper limb a Kaibab squirrel was busily eating, tail curved over his back while he cut the whole outside off the cone with his sharp teeth.

The squirrel moved about, sampled the tender bark at the end of a twig from which he had nipped the needles. He whisked about, always seeming to get something between himself and the camera. Mrs. Pack stood still and talked with soothing tone. It might work with other animals but the squirrel disdained the method and sought an upper branch and stayed there. We were about ready to give up but sat silently by the camera for an hour. Suddenly a squirrel appeared about fifty feet away on the ground, apparently one of the pair. He was unmindful of us and seemed to be wrestling with a large yellow hardwood leaf or a piece of buttered paper from our stores. I slid over to the camera, focussed on him and cranked. It was a perfect picture, except for the dark background and the lack of light. Presently he ran about four feet up the trunk of a large pine and sat for a perfect side-view portrait on the stub of an old limb. I cranked a yard of film at slow speed. Presently the other little fellow became restless and came down for a few minutes. Before the dark enveloped them, I got them both. Then I stowed away my camera and we made our way back to camp and got a good sleep before we moved on to the lovely aisles of Zion.

The American Tree Association stands for a constructive policy of forest protection and extension, to increase appreciation of forests as natural resources essential to the sound economic future of the country.

The Association directs encouragement of tree planting by the public; disseminates popular forestry news for the information of editors of the daily press; and compiles and distributes forestry news and reports on legislative progress for assistance of active foresters in the field.

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"Example" Tree Planting Is Urged

Governor Roosevelt of New York Suggests Beautification of Highways: School Forests Being Planted.

In a special message to the legislature Gov. Roosevelt of New York asks authorization to spend $10,000 of the highway fund for "example" tree planting along the highways of the state. The planting would be done in different parts of the ten highway districts. The governor, himself long a tree planter, believes such a step on the part of the state would cause communities everywhere to work out similar roadside tree planting plans. Editors of the state responded to the message with hearty indorsement. They agree with the governor that tree planting along the highways would greatly enhance the scenic beauty of the state.

Public schools of Jamestown have embarked on a reforestation project to plant 350 acres in a school forest. M. J. Fletcher, Superintendent of Schools, purchased through the public schools by means of entertainments, special contribution, etc., a tract of 150 acres on which to establish a school forest. Plantations were made on this tract in 1928 and 1929, 20,000 trees being planted each year. Another large planting was made this year. The work was done under the direction of Gustave E. Bentley, principal of the Washington Junior High School, who is president of the city school forest. The city schools have also completed negotiations for the purchase of a plot of more than 200 acres adjoining the original one of 150 acres. This is the largest school reforestation project that has yet been undertaken in New York. The largest previous project of this kind was the Watson school forest of 98 acres started in 1921, the reforestation of which is now nearly completed. Another new school district forest project undertaken this year is the school district of West Sand Lake which has acquired two and one-half acres on which the initial plantation was made this spring.

Charles R. Meek, Chief of the Pennsylvania Bureau of Extension, reports the school board of York Springs is contemplating establishment of a school forest. The school board now owns 12 acres of land, six of which are devoted to a school forest. At the request of L. E. Potts, a member of the school board, Mr. Meek made an examination of the area in company with the principal, Prof. Starry. The present plan calls for planting 12,000 forest trees over a period of three years, with as many varieties as possible, and have the school children do the planting.

As to community tree planting the Home Garden Club of Denver is setting a fine example. Three thousand yellow pines have been planted according to the report of Mrs. E. W. Simmons, chairman of the forestry committee, to the American Tree Association. Miss K. Craig, the state superintendent of public instruction, sent the call for tree planting to teachers throughout the state. In his State Forest Week message Gov. William H. Adams pointed out that: "Colorado is especially dependent upon forests, clothing as they do the watersheds of the rivers and streams which supply hundreds of thousands of acres of tillable soil with life-giving water. Our forests, green and vigorous, tend to regulate the flow of these streams, lessening floods and preventing, in a measure, low water."

In Alabama the conservation department of the third district, Federation of Women's Clubs has planted one hundred trees on the highways, Mrs. C. S. Moss reports. The names of the tree planters have been registered on the honor roll of the American Tree Association.

Inspired by the suggestion of a state D. A. R. forest to exemplify the idea of reforestation as a workable conservation measure, Mrs. W. P. H. McFaddin, Texas State Chairman of Conservation and Thrift Committee, encouraged by the National Chairman, Mrs. M. C. Turner, and by the State Regent, Mrs. James T. Roundtree, sought to obtain for the Texas Daughters ownership of timberland for reforestation purposes. During the Twenty-ninth Annual Texas D. A. R. Conference announcement was made of a gift of one hundred acres of pine land by Mr. W. P. H. McFaddin, of Beaumont, to the Texas D. A. R., with the provision it be properly and constantly cared for by them. Later the society purchased fifty acres adjacent to the tract located north of Buna on State Highway No. 8, and thus became the first state organization to own a D. A. R. forest. The Col. George Moffett Chapter D. A. R. through this committee: Mrs. Earl Middleton, Mrs. W. G. Lovell, Mrs. J. E. Storey, has recorded the event in a booklet.

Tree planting has been started by the Eau Gallie Garden Club in Florida. Mrs. W. H. H. Gleason, the president, reports the planting of 55 palms. The names of the tree planters are on the national honor roll.

Memorial tree planting is going forward everywhere. The San José Chapter of American War Mothers has planted for those who served in the war. Other plantings by the chapter are at the Woodrow Wilson and Theodore Roosevelt Jr. high schools. At Long Beach a memorial tree has been planted for W. E. Montfort, city editor of the *Press Telegram,* who lost his life in an aeroplane accident.

A memorial tree planting in honor of a soldier of the Revolution is reported from Springfield, Tenn., by the D. A. R. Elias Fort is the name of the soldier. The memory of each Robertson County soldier is being honored with a tree.

At Stillwater, Okla., dedication of a memorial tree in front of Whithurst hall on the campus of Oklahoma A. and M. college marked the launching of a state-wide program by the Oklahoma Forestry Association for the establishment of memorial groves and parks in the cities of Oklahoma. Among those who attended were: George R. Phillips, state forest commission; Dr. Henry G. Bennett, president of A. and M.; Tom J. Hartman, Tulsa, president of the Oklahoma Forestry Association; Mrs. Lee Wallice, Yale, and Mrs. V. B. Gorman, Muskogee; Dr. W. W. Phelan, president of Oklahoma Baptist university.

Tree planting fits all times and programs. Have you placed a tree somewhere to which you can point? Fall tree planting time soon will be here again. Why not make your plans now?

WOR CALLS YOU TO ENLIST IN TREE ARMY

The tree planting message goes out regularly over WOR at Newark, N. J. where Sarah L. Sawyer, "Bamby, the Tree Lady", talks on trees and the out of doors. She invites all in her audience to join the American Tree Association by planting a tree. The response to this call to enlist in the tree planting army brings scores of letters. The application blanks and tree planting suggestions are sent at once. Make your plans for Fall planting now.

Helps and Hints

FOR HOME AND GARDEN

PLANTING THE GARDEN, MONTH BY MONTH

By Romaine B. Ware

JUNE does not rank at the top as a planting month and still there are a great many items that may be put in the ground at this time. The important thing is to recognize the limitations of the season and attempt to plant only those things that are practical. If you have not completed the setting out of annual seedlings, it may still be done but great care must be used to see that they do not suffer for water and wilt so badly that they cannot recover.

Wilting, generally resulting from excessive heat and the consequent evaporation from the foliage, is frequently fatal because there are not enough roots to supply moisture to the leaves. You cannot grow roots over night, but you can balance things up by removing a portion of the leaves, thus reducing the surface from which evaporation takes place. Pinching out or cutting off the top of each plant will remove the fastest developing part and by checking the growth at this point allow the root to catch up. Sometimes it is wise to remove some of the largest leaves entirely or to cut off a half or two-thirds of each one with the scissors. Don't hesitate about cutting the plant back as you are thereby aiding it in the struggle to establish itself. Selecting a cool, cloudy day for transplanting is also desirable or if the sun is bright, shading the plants by a shingle stuck in the ground to keep off the midday sun.

YOU will find that potted plants will transplant easier than seedlings from flats or the nursery row as the roots of potted plants are not disturbed so much. There are available today pots made of peat moss in which seedlings may be started and the plant, pot and all, set out in the garden. The pot will gradually disintegrate, the roots growing right through it, and the plant will receive no check in growth from transplanting. These pots are not very expensive; the No. 2 size, suitable for seedlings, is priced $3.00 a hundred at retail.

The early part of the month is not too late to set out roses if you use the potted ones. Dormant plants, no matter how well they have been kept, will not be as satisfactory this late in the season because the weather is warm and they will not be able to make the needed root growth. Potted roses may be set out without disturbing their root contact with the soil and in well prepared soil they will hardly know they have been moved. It is not absolutely necessary that these potted roses be cut back as many will already be in bud; but if you want them to give you the best possible results both this year and throughout the years to come, they should be shortened back, allowing but two eyes or buds upon

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A Suggestion

If you don't know much about Tulips or other bulbs why don't you let our bulb expert make a selection for you? Tell us your favorite colors, he'll do the rest.

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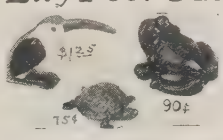

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40 Novelty Snapdragon plants, assorted, large supply	1.10
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each shoot. The result will be that active root and top growth will take place simultaneously and the plants will establish themselves much better.

AT THIS season your rose beds will benefit from almost daily cultivation. It need be but a scratching of the surface, but this will help to keep the soil cool and moist, allowing air with its life giving oxygen to penetrate into the soil. Oxygen is necessary that bacterial action may take place. June is a month when roses produce a prodigious amount of bloom and they must have ample food available. Unless there is already in the soil a goodly supply of plant food, they should be fed regularly. Liquid cow manure is excellent for this purpose. A bushel of manure in a sack, suspended in a barrel of water for three or four days, will provide a generous supply. This may be diluted about four to one and applied to the soil around the roses. If the ground is moist when it is applied, penetration to the roots will be better. A weekly application of from two quarts to a gallon of this diluted liquid manure will not be too much for each rose, the amount depending upon the size and vigorousness of the plant. Spraying or dusting at regular intervals must not be neglected or your roses will suffer from the attacks of insects or disease.

SUCCESSIVE plantings of gladiolus bulbs may be made every two weeks right up till midsummer and you will have a continuous crop of bloom for cutting and display. For planting late in the season only the larger sizes of bulbs should be used. Bulbs planted now may be the smaller sizes, Numbers 2, 3 and 4, as they will prove satisfactory for cut flowers and will make fine bulbs to carry over for next year. These smaller bulbs can be bought for con-

Lucky! Read This One

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We offer good fresh roots at $2.00 per doz. postpaid; or, by express, $8.00 per 100; 200 or more at $7.50 per 100. Such a mixture has never before been offered by anybody at any price. Little more than covers expenses. Order early if you want to be in on this. Money back if over sold.

Hudson River Iris Gardens
162 Montgomery St. Newburgh, N. Y.

What makes a good
PLANT LABEL GOOD?

It must be impervious to moisture, must retain its markings, and must not girdle the Plant—WE HAVE IT.

Sample Line for the Asking

THE AQUAPROOF PRODUCTS CO.
2175 East 76 St. Cleveland, Ohio

TEN CACTI

Blooming size All different

Postpaid for $2.50

Table garden size $2.00

JAMES ALLAN
Mountain Park New Mexico

EXTRAORDINARY OFFER of GLORIOUS MAY-FLOWERING TULIPS

All of magnificent size and coloring. Clean, top size bulbs sure to bloom. Because of our connections with some of the best Holland Bulb Growers we are enabled to offer these bulbs at the very lowest prices.

SPECIAL SPRING OFFER

DARWIN TULIPS

100 . . . . . $ 3.25
1000 . . . . . 30.00

These special prices are for orders received before August 1. Grand assortment made up from named sorts only.

Many other choice varieties listed in our Bulb Catalog. Ask for it.

SPRING HARBINGERS!

Delightful little gems for edgings, rock gardens, etc. CHIONODOXA (Glory of the Snow); ERANTHIS (Winter Aconite); GRAPE HYACINTHS (Heavenly Blue); SNOWDROPS (Single); SCILLA CAMPANULATA (Bluebells); any of the above:
Dozen, 40c 100, $3.00

100 Crocus Mixed . $ 2.50
1000 Crocus Mixed . $24.50

Bassi Frères Inc. de Paris

SEEDSMEN : NURSERYMEN
509 Main Street New Rochelle, N. Y.

A POND FULL of LILIES for $4

Send today for this unusual collection consisting of two water lilies—MASANIELLO, deep pink, and MARLIAC YELLOW, and 5 plants to complete the pool including fish plants. Splendid, vigorous plants—mailed postpaid anywhere in the U.S. or Canada. Our beautifully illustrated 36 page catalog describes many other postpaid collections. 100 varieties described. Full cultural instructions and plans for building pools. Free to you.

Johnson Water Gardens
NM-60 HYNES, CALIFORNIA

STUPENDOUS OFFERS OF HIGH QUALITY BULBS

GLADS, DAHLIAS, ROSES, TULIPS, DAFFODILS, HYACINTHS, etc.
New 1930 price lists mailed FREE.
HOLLAND BULB COMPANY
Dept. N Lake Como, N. J.
NURSERIES: Noordwykerhout, Holland and Lake Como, N. J.

siderably less than the No. 1's. You may not be able to find the smaller sizes in the stores, but if you will study the catalogs of some of the growers who grow mainly gladiolus, you will find them listed at a half or a third of the prices of larger sizes. By the way, do you know how to tell a young vigorous bulb from an old worn out one? Size is not the only thing that counts. The young bulb will be plump, high and thick rather than thin and flat. The latter kinds are the old bulbs that are about bloomed out and ready to be discarded. There are a few exceptions to this rule as some varieties will produce thinner bulbs, but as a general rule it is safe to follow.

IT IS not too early to think about starting perennials from seed. By this method you can produce hundreds of perennial plants at the cost of a few dozen ready grown and besides you will have all the pleasure of growing them yourself. As a keen observer you will learn much about the habits and needs of the plant by growing it from seed. Your own plant children will hold greater interest for you than the ready grown plants will. There are a baker's dozen of species that are most satisfactory when raised from seed. I'll list them—coreopsis, delphinium, aquilegia, hollyhock, digitalis, gaillardia, perennial flax, *Linum perene*, platycodon, pentstemon, primrose, pyrethrum and violas. Countless other things can also be grown from seed, some requiring more skill than others. Those listed above are easy to grow, as easy as the commonest annuals.

THERE are some perennials that are much better purchased as plants and in named varieties only. Peonies, iris, phlox and Oriental poppies are the most important ones. If these are grown from seed, there is but a small chance of getting quality plants. One large grower of peonies has planted and flowered over a million seedlings and from the entire lot has only secured fifty that were worthy of propagation. As the proper season arrives I will tell you how the above plants may be propagated to give you more plants at a reasonable cost. Just now it is suggested that you plan what varieties you will raise from seed this summer, make out your list and order the seeds. A cold frame is ideal in which to start the seeds and next month, July, is a good time to do it. I know that many advise planting them later, but July planted seed, if properly cared for, will give you better plants to winter over and to bloom next year.

WITH some annuals it is desirable to make successive sowings to keep up the display of bloom. Poppies, annual gypsophila, sweet alyssum, larkspur, candytuft, and mignonette are none of them long season bloomers and several sowings may be made. For conspicuous places it is sometimes desirable to start extra plants in pots that they may be set out already to bloom just where they are wanted.

Seasonable care in the garden will not only include cultivation, feeding and watering but also the pinching back of such things as chrysanthemums, helenium, Michelmas daisies and similar things. This will cause them to branch and become bushy plants. Roses should be carefully disbudded

Bring the glory of the hills to your home

NOTHING is more beautiful than the glorious spring blooms of Rhododendrons and Azaleas—modest white, soft orchid pink to orange yellows. Our nursery-grown native Rhododendrons can come to you at very reasonable prices. Catalog on request.

Special offer for $25 includes 12 plants, 1 to 3 feet high, ten different, enough to cover 25 to 40 sq. feet. The blooms are from white to orange, April to July—a wondrous series of blossoms.

La Bars' broad-leafed evergreens call for no maintenance expense. Cold will not kill them. They blend with all forms of architecture. Our nursery-grown stock conserves native forests.

Price for this superior collection only $25, packed, f. o. b. Stroudsburg. Please send check with order.

Each plant marked and guaranteed true to name. We have the largest Rhododendron nursery in America.

Visitors welcome to nursery. Write for full list of shrubs in this offer.

LA BARS' RHODODENDRON NURSERY
Box M STROUDSBURG, PA.

Grow GLADS

MAKE your garden the envy of your friends with Gove's Hardy Vermont Glads. Best of garden cut flowers —very easy to grow. Our special "get acquainted" offers will make you an enthusiastic "glad fan". Bulbs guaranteed to bloom first year.

100 Large (1" to 2") Vermont Bulbs $3

This collection includes at least 35 fine varieties, in many shades of Red, Yellow, Pink, Blue, Orange, Smoke, White, all good ones but not labeled as to name. 50 for $1.75. *All sent prepaid* with complete instructions for growing prize-winners. I believe this to be the finest "glad" collection offered anywhere.

Specialty Collection

Annie Laurie, exquisite ruffled Pink; **Emile Aubrun**, large bronze; **Apricot Glow**, beautiful Apricot-colored; **Golden Dream**, finest clear yellow; **Marnia**, very large Orange. All five rare varieties—labeled, $1. (regular $1.50 value). Both collections prepaid, for $3.85. Send for illustrated catalog "that is different", listing over 300 of the world's best varieties:

5 BEAUTIFUL RARE VARIETIES $1.50 VALUE $1

Champlain View Gardens
Elmer E. Gove Box 65 Burlington, Vermont

Superlative TULIPS

We specialize in the importation of the choicest Dutch bulbs for discriminating amateur and professional gardeners. Judicious selections of rare beauty, at *Unusually Low Prices* for tulips of the highest quality.

They are All in Our New CATALOG

We Should Like to Send It to You. Rich Illustrations. Clear Descriptions. Our advice about planting. Please address, Cheswick, Pa.

Schenley Gardens Inc.

GENUINE DUTCH BULBS

A. E. WOHLERT
The GARDEN NURSERIES Narberth Pa.

Oriental Flowering Trees

America's Finest Collection

Japanese Rose Flowering and Weeping Cherries, Flowering Crabs; in all varieties and sizes. Send for free book with color illustrations.

A. E. WOHLERT
927 Montgomery Avenue
Narberth, Montgomery Co., Pa.

A Book about IRISES

sent free to gardeners who want complete, intelligible descriptions of new varieties. Lists a careful selection of standard iris including the famous Williamson originations.

THE LONGFIELD IRIS FARM
Bluffton Indiana

WATER LILIES

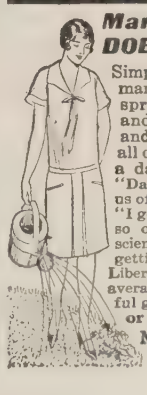
Gold and Tropical Fish

Everything for the water garden. Our free Catalog contains much valuable advice and many illustrations.

BELDT'S AQUARIUM
2141 Crescent Ave.
St. Louis, Mo.

Kills Dandelions Easily

Marvelous New Treatment DOES NOT KILL the GRASS



Simple and easy to use. Quick and permanent results. Non-poisonous. Just sprinkle your yard with DANDELEX, and PRESTO—Dandelions wither up and die. Rid your lawn once and for all of these obnoxious pests, and have a dandelion-free lawn. Users say: "Dandelex is the right thing at last to rid us of dandelions." "Send me another bag." "I got good results with Dandelex." And so on. Tell your neighbors about this scientific preparation, and club together getting special prices on quantity lots. Liberal supply, 20 pounds, enough for average lawn, only $2.98. Have beautiful green grass. Satisfaction guaranteed or your money back. *Order at Once!*

MISSION LABORATORIES, Inc.
561C Grand, Kansas City, Mo.

Elliott's Guaranteed TULIPS

SOLD WITH A MONEY BACK BOND

The World's Finest Tulips at Bargain Prices... Free Fertilizer . . . Order NOW ~ Pay next Fall~~Offer Expires July 1 . . . Valuable Bulb Book ~ FREE

HERE is your opportunity to get the aristocrats of the Tulip Kingdom at a price much lower than is often charged for nameless, ordinary bulbs. Every tulip offered is in the Giant class, famous for its big, shapely, exquisitely colored blooms, its long, strong stems, its vigorous, sturdy growth.

60 Darwin and Breeder Tulips $3.75

COLLECTION A

6 CLARA BUTT . . . . . *Delicate Salmon Pink*
6 EUTERPE . . *Mauve-Lavender, Lilac-Edged*
6 FARNCOMBE SANDERS . . . *Fiery Scarlet*
6 PRIDE OF HAARLEM . . . . *Deep Old Rose*
6 PRINCESS ELIZABETH . *Pink, Light Border*
6 BARONNE *de la* TONNAYE . . . *Vivid Pink*
6 BRONZE QUEEN . *Buff and Golden Bronze*
6 LOUIS XIV . . . . . *Royal Purple and Gold*
6 GLOW . . . . . *Deep Glowing Vermilion*
6 INGLESCOMBE YELLOW . . *Glossy Canary (Darwin Type)*

COLLECTION B: 100 Bulbs (10 each) $5.50
COLLECTION C: 250 Bulbs (25 each) $13.25

These 3 collections are Special Bargain Offers. They are not duplicated in our catalog. They must be ordered from this advertisement.

Carriage prepaid on all Collections Everywhere in the United States

WITH every order, we will send FREE, a liberal supply of Superfine Fertilizer and Soil Conditioner, made by us especially for these collections. This plant food will enrich your soil, and make your results better.

We guarantee that these bulbs are ***true to name,*** and have reached their full maturity, so will produce perfect blooms. We guarantee that they will grow in any climate and in almost any kind of soil. If you are dissatisfied in any way, ***your money will be refunded instantly.*** There are no strings to this Bond.

Our buyers must sail early in July to be certain to get the pick of the best Holland crops. ***YOUR ORDER MUST REACH US BEFORE JULY 1.*** October is planting time; we make no deliveries until then. We do not require payment until delivery time. ***IF YOU WISH TO SEND CASH WITH ORDER, YOU MAY DEDUCT 5%.***

FREE BULB BOOK: A garden grown from bulbs is a lovely, rich, aristocratic garden. For bulbs produce beautiful flowers. Read about a wonderful choice of Hyacinths, Narcissus, Tulips, Lilies, and many unusual flowers. Send for our Free Bulb Book; IT IS A FREE COURSE IN BULB CULTURE. For 41 years it has been the guide to those who grow the better kinds of flowers.

The Biggest Bulb House in the World

ELLIOTT NURSERY CO.
510 Magee Bldg. . . Pittsburgh, Pa.

HOLLAND'S FINEST BULBS

AT AMAZINGLY LOW PRICES

Price lists mailed upon request.
Many NEW varieties introduced.

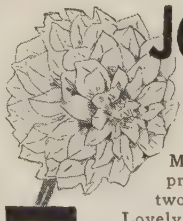
HOLLAND-AMERICAN TULIP CO.
Desk 14 Avon-by-the-Sea, N. J.

If specimen blooms are wanted rather than clusters. Peonies must also be disbudded of all side buds on each shoot, leaving only the central bud to mature. This will result in larger and more perfect flowers. Dressing with weak liquid manure just as the buds are about to open will aid in producing high quality blossoms. Practically all flowers need plenty of water at blooming time, but many should not have it sprayed upon their foliage. Allowing the water to run from the hose with the nozzle removed is an ideal way to thoroughly irrigate the soil. Be sure to apply enough water to wet down deeply where the roots are. Surface sprinkling is worse than useless.

SPRAYING, watering, cultivating, feeding as well as planting will make this a busy month, but with it all you will find time to enjoy the fruits of your labor. June is the month of results, it is the culmination of the spring flower display, the iris are at their height, peonies CLAP the climax for georgeous display and roses add the finishing touch to our overflowing floral pageant. Many lesser satellites help to make up the picture, and as we wander among our flowers it seems that even the lengthy days of June are not long enough to enjoy all of the splendor that Nature spreads before us.

Landscape Gardening

In this day and age, the plan's the thing. To have beautiful home surroundings without definitely placing each tree, shrub, and border is impossible. Hit-or-miss methods create only messes. But only a few people are artistic enough to be able to develop worth-while plans without some knowledge of landscape architecture, and to give a glimmer into the art, Macmillan Company has brought out *Landscaping the Home Grounds,* by L. W. Ramsey, well-known landscape architect. It lays down the fundamentals of creating the home beautiful, and contains practical hints, charts, illustrations and data invaluable to those about to improve their surroundings. The price is $2.00.



Jersey's Beauty DAHLIA

and

JERSEY'S BEACON

Most famous prize winner of two continents. Lovely soft clear pink, perfect shape. "Beacon" admired everywhere for its spectacular flame flower. Both easy to grow. Postpaid to your door. Order now. Planting time is near.

3 for $1.50

WILLOW DAHLIA GARDENS
102 Pompton Avenue Cedar Grove, N. J.

Desert Cacti

8 Blooming size plants and 8" Mexican hand painted bowl $3; 5 plants 5" bowl $2; 10 plants $2. 4 plants $1. Miniature bowl and baby cacti FREE with every order. Postpaid.

BORDER CACTI CO.
Box 1259 El Paso, Texas

The summer mulch

—preserves moisture
—keeps down the weeds

Imagine your garden with an *abundant* supply of moisture all summer long through drought or dry spell.

Imagine a garden where weeding is practically *unnecessary.* These results are both attained through the use of

TRADE MARK G PM

PEAT MOSS

Let us give you complete information Sample free on request. 2-bushel package, $1.50 at your dealers, 25 cents extra for postage direct from us.

ATKINS & DURBROW, INC.
E-25 Burling Slip New York City, N. Y.

WHY BUGS LEAVE HOME

Trade Mark Registered

NOW is the time to spray your plants, flowers, shrubs and evergreens with Wilson's O. K. Plant Spray . . . the nationally recognized standard insecticide for all flower and garden pests. It is highly effective, yet will not injure the most tender, young plants. It is harmless to humans, clean and easy to apply. For sale at all dealers, order your supply now.

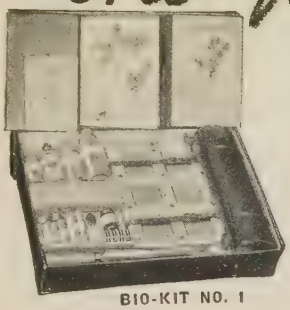
Also Manufacturers of
WILSON'S WEED KILLER
The Modern Way to Kill Weeds
WILSON'S RHODY LIFE
For Rhododendrons
FOR SALE BY ALL DEALERS

Andrew Wilson INC.
Dept. V6
SPRINGFIELD, NEW JERSEY

Are You in Touch with Nature?

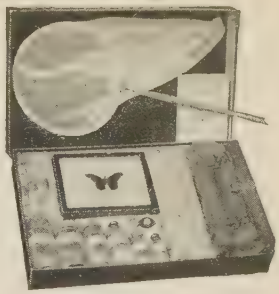
THE BIO-KITS

"Study Nature, Not Books"— L. AGASSIZ



Readers of "Nature Magazine" have a very distinct advantage over other people because they take an interest in and know how to appreciate the marvels of NATURE. At this time of the year, Nature abounds in beautiful insects, plants, and animals. As intelligent beings we ought to understand more about these other living organisms all around us. What more interesting pastime or hobby can a person adopt, be he young or old?

The BIO-KITS contain the essential paraphernalia to help you appreciate the wonders of Nature, including a handbook of directions for the care of your own collection. If you intend to spend any time this season in the open, or if you are going to camp, a BIO-KIT is indispensable.



BIO-KIT NO. I
For Plant Collecting

Contains the following:—"The Bio-Kit Handbook", collecting can and shoulder strap, combination pocket lens and compass, plant press, drying felts, corrugated ventilating boards, herbarium, pressed and mounted plant, herbarium glue, glue brush, glass mounting plate, gummed herbarium tape, forceps, formaldehyde solution, denatured alcohol, specimen bottles, vials, corks, specimen boxes, and trowel. In large container, making an excellent gift.

We furnish biological supplies to schools and colleges of the country.

NEW YORK BIOLOGICAL SUPPLY CO., Dept. N,
34 Union Square, New York, N. Y.
Gentlemen: Enclosed please find $..... for item (s) checked below, money to be refunded if not found entirely satisfactory:
☐ BIO-KIT No. 1—For Plant Collecting $8.50
☐ BIO-KIT No. 11—For Insect and Animal Collecting $8.50
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BIO-KIT NO. II
For Insect and Animal Collecting

Contains the following:—"The Bio-Kit Handbook", collecting bag with shoulder straps, combination pocket lens and compass, insect net with bamboo handle, killing jar, insect spreading board, Riker specimen mounts, spread and mounted butterfly, insect pins, forceps, formaldehyde solution, denatured alcohol, specimen bottles, vials, corks, and trowel. In large container, making an excellent gift.

Your Dog needs CHARCOAL!

KEN-L-RATION contains all the food elements so necessary to the dog. Pure charcoal is indispensable, and just the correct amount of this valuable ingredient is contained in every can of Ken-L-Ration. Pure meat, cereals, cod liver oil and charcoal make Ken-L-Ration the perfect dog food. Do not accept substitutes.

Send For FREE Sample

CHAPPEL BROS., Inc.
1110 Peoples Ave.
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Ken-L-Ration is sold in more than 50,000 stores. Ask for it by name.

KEN-L-RATION
THE DOG FOOD SUPREME

For Your Dog

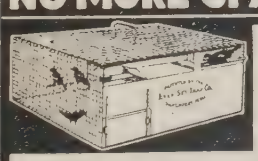
Health, strength, and extra vitality when you have these appetizing products on the daily feeding schedule.

Miller's A-1 DOG FOODS

Ask your dealer today, insist on Miller's, if he cannot supply you send ten cents for your copy of "Dog Care Simplified" and crisp fresh samples of the foods.

BATTLE CREEK DOG FOOD CO.
682 State Street, Battle Creek, Mich.

NO MORE SPARROWS!



Sparrows drive away song birds, spread disease among poultry, destroy gardens, deface buildings. Ever-Set Traps are a positive, easy, humane way to get rid of them. 20,000 satisfied users testify to this! Send $4.75 for an Ever-Set Trap. Money-back guarantee. More information on request.

EVER-SET TRAP CO. Dept. C Davenport, Ia.

Healthy Poultry | More Song Birds | Undisturbed Gardens

Nature School

"A School in the Forest" it has been called, the Allegany School of Natural History. Such it is. The vegetation which has covered the land in Allegany State Park and the animal and bird life which it harbors are of great interest to the Nature lover or even to the casual observer. In the Park is the meeting place of many of the northern and southern plants. Of the former, there are the white pine and hemlock for the conifers; the sugar, the red, the silver, the striped and the mountain maples; the beech, the yellow and black birches; the serviceberry, the cherry; the trembling and the large-toothed aspens. Of the southern plants and trees, there are the red, the black, the white, the chestnut and the swamp oaks; the bitternut, the pignut, the shagbark and the mocker-nut hickories; the elm, the ironwood, the blue beech, the white ash and the locust; the chestnut, the sassafras and the yellow poplar. In addition to these are many species of the willows, the dogwoods, and the hawthorns. Then of the trees which are abundant further south, there is in the Park a scattering of the tupelo, the pawpaw and the magnolia. Thus there is found in the Park the interesting combination of trees whose natural home is beside the waters of the Hudson Bay growing with trees whose home is along the Gulf of Mexico.

Westchester Takes Warpath

The vigorous Westchester County Conservation Association, through their official publication, *Westchester Magazine*, has called for a spring campaign against the illegal sign nuisance. They have gained the cooperation of the Westchester Lighting Company who are to take down signs on their poles erected without authority, and ask each motorist to "make it his duty to stop and remove the occasional illegal sign he finds." The program, the editors feel, will do more than just temporarily improve the roadsides, for "every sign promptly removed will go far to convince the advertisers that their money will produce better results in more legitimate channels." Other counties may well follow the example Westchester sets.

Kills Fleas ....Instead of stupefying them

PULVEX ALONE contains the one ingredient which U. S. Bulletin No. 897 declares is the only powder substance that actually kills fleas. When used, Pulvex kills the fleas; they never revive and reinfest the dog or cat.

ABSOLUTELY HARMLESS to everything except fleas, lice, ticks, mites. Non-irritating to the skin. Odorless. Pleasant to use. A dusting keeps fleas off the dog for 14 days. Any wonder that leading dog breeders use Pulvex exclusively and highly recommend it?

Give your children's dog a flea-free summer with Pulvex. At all druggists and pet shops, 50c; or direct from William Cooper & Nephews, Dept. A-175, 1909 Clifton Ave., Chicago, Ill.

PULVEX
Sold On Money-Back Guarantee

Taxidermy

Preserve your specimens of natural history. Let Jonas Bros. mount them true to nature. Mounted Mammal and Bird Groups, Trophies, Fur Rugs, etc., for institutions and individuals.

Send for illustrated booklet, "Art in Taxidermy."

Master Taxidermists

1023 Broadway — JONAS BROS. — Denver Colorado

SCOTTISH TERRIERS

Beautiful young stock now ready for delivery. Price reasonable.

Loganbrae Kennels
Rutland, Vt.

IT'S 6 TIMES NEARER
with

$5.00
"BIASCOPE"
[AMERICAN MADE]

Your enjoyment of hunting, hiking, fishing, motoring, camping, or bird study will be increased many times by the Biascope. Unexcelled for field sports. Makes distant objects 6 times as big. Precise optical qualities . . . fine finish . . . leather case free.

"POCKESCOPE" $2.00
Made in the same finish and possessing the same optical qualities as the Biascope, this compact pocket telescope magnifies 6 times. Supplied with leather case.

Either at your dealer's or sent direct, postpaid, money back guaranteed. Catalog free.

WOLLENSAK OPTICAL COMPANY
760 HUDSON AVE. ROCHESTER, N. Y.

AUBURN

Model 125
Four Door
Closed Car
STRAIGHT EIGHT

125 Horsepower 130" Wheelbase

$1495

Prices f.o.b. Auburn or Connersville, Ind.

Equipment other than standard, extra

EVERY craft can't stand an outboard motor. But this "Old Town" can! She's an outboard boat by build! Extra-strong stern that won't "give" under the motor's weight. Heavy, non-leak canvas covering never needs soaking or caulking. Swift, light and easily handled.

Free catalog shows all types. Big, fast, family boats; dinghies; rowboats; speedy step-planes, and canoes. Old Town Canoe Co., 186 Main St., Old Town, Maine.

"Old Town Boats"

WELCOME TO HOTEL
MANHATTAN
157 West 47th St., New York

Large room and bath.....$2.50 to $3
Double.....$3.50 to $5

"In the heart of Times Square"
Convenient to stores, theatres and garages.

Loose Leaf Nature Booklets

How to Study and Collect Insects, Illustrated 50 cents. North America Tree Check List, 50 cents. 200 subjects on Nature, Indian-lore and Woodcraft. Send for Catalogue.

BUCKSKIN PRESS
3812 Huntington Ave., Covington, Kentucky

Radio Dog Club

Each Thursday evening about eight o'clock the dogs of the nation have their "day" when Dr. Glenn Adams and the Radio Dog Club meet over station WLW of Cincinnati, Ohio, for a quarter-hour discussion of dogs. The program consists of talks on care and feeding, kennels, training, summer care. Dr. Glenn is a doctor of medicine by profession but a dog lover by avocation, and he is giving much help to dog lovers everywhere. The Radio Dog Club, which is rapidly growing, invites all interested to enter their dogs and "listen in." Applications are received at the Battle Creek Dog Food Company, 382 State Street, Battle Creek, Michigan.

Four Years Old

The fourth birthday of the *Bulletin of the Nature Study Club of Indiana* was duly celebrated in March, as was the 16th anniversary of *The Buzzer,* the first club publication which died a premature death a year later, and eleventh of *The Hoosier Outdoors,* which supplanted the *Year Book.* Rich as is the Club in publications, it has been even richer in Nature associations and is one of the most vigorous Nature groups in the country.

A Spray Guide

A most instructive and valuable booklet has recently been issued by the Agricultural Experiment Station of Oregon State Agricultural College under the title of "Sprays, Their Preparation and Use." It has been prepared by R. H. Robinson and discusses the various chemicals used as sprays and their specific functions as pest-destroyers. Every orchard owner will wish a copy. The Station is located at Corvallis, Oregon.

FREE—Rare Tropical Butterflies

As it is too late to supply cocoons of our many-colored giant moths, as recently sold to hundreds of Nature Magazine readers, I will now furnish the moths papered, unmounted as follows: EIGHT specimens (4 pairs) Cecropia, Polyphemus, Cynthia, Promethea for $2.25—or 4 specimens (1 of each) mounted in glass-topped Riker mounts for $3.50.

FREE OFFER—With each order I will include FREE your choice of 1 unmounted Urania ripheus, the gorgeous, multiple-tailed, sunset-colored Madagascar butterfly (considered the world's most beautiful insect); or 1 unmounted Morpho achilles, the large iridescent, metallic blue and black butterfly of South America. If wanted in Riker mount add 50c. These rarities are priced by dealers at $1.25 to $3.25 each.

FREE INSTRUCTION BOOK—I will also include FREE, on request, the 30-page, illustrated book, "How to Collect and Preserve Insects", by Dr. F. E. Lutz, Curator of Entomology at the American Museum of Natural History, N. Y., containing instructions for relaxing and mounting unmounted specimens, killing, collecting, preserving, etc. Remit to C. Wm. Wurster, Suite 1603-E, 104 Fifth Avenue, N. Y.

Learn Photography at HOME

Make money taking pictures. Prepare quickly during spare time. Also earn while you learn. No experience necessary. New easy method. Nothing else like it. Send at once for free book, *Opportunities in Modern Photography,* and full particulars.

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TEN DAYS' FREE TRIAL!
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THE TRANS-NEPTUNIAN PLANET

(Continued from page 396)

and Mars. Jupiter, Saturn, Uranus and Neptune might be picked up telescopically as inconspicuous objects when farthest east or west of the sun, though Jupiter would be almost too close to the sun at the distance of the new planet to be found at any time. In other words, at the distance of the new world all the planets that bring beauty to our evening skies are unseen and unknown. The splendor of Venus, the rings of Saturn, the satellites of Jupiter—even Jupiter itself—the mysteries of Mars, would be unknown to us were we transported to that distant world and could exist there where nitrogen and oxygen are solids and strange compounds may exist at temperatures that are not far above the absolute zero. At the surface of the new planet the sun appears only as an intensely brilliant star and the heat that the planet receives from it is about one two-thousandth part of that which is received by the earth.

One turns with a shiver from the contemplation of this frigid and lonely world moving sluggishly around the sun in its 300 year period to lively little Mercury, tucked in close to the sun, beautiful Venus, mysterious Mars, giant Jupiter with his large family, and ringed Saturn, and rejoices that they are so near and that we know them so well.

Star-gazers this month will find the constellations of Boötes, Corona, Hercules, Lyra and Cygnus extending across the eastern sky from the meridian to a point near the northeastern horizon in the order named. The fine reddish-orange first-magnitude star, Arcturus, is now due south on the meridian about eight-thirty in the evening in the middle of June. Leo is high in the west and Virgo is passing to the west of the meridian in the southern sky. Castor and Pollux in Gemini are nearing the northwestern horizon. Antares, in Scorpio, will soon come well into view in the southeast and Aquila in the northeast. Capella is now almost too close to the northwestern horizon to be seen but Vega shines like a brilliant blue-white diamond high in the eastern sky. The Big Dipper is high in the western sky and close to the meridian.

Venus is now well up in the western sky at sunset and sets more than two hours after the sun. As always, it far outshines all other stellar objects.

Saturn is now in Sagittarius. It will rise about an hour after sunset in the southeast on the fifteenth of June and be visible all night. It will be in opposition to the sun on June 30. Mars is now in Aries and may be seen in the eastern sky before sunrise. Jupiter is now too close to the sun to be seen. It will be in conjunction with the sun on the twentieth when it will pass from the evening to the morning sky.

Mercury will be at its greatest distance west of the sun on the fourteenth but will be poorly placed for observation low in the northeast before sunrise. On June 21, at 10:54 P.M. Eastern Standard Time, the sun will be at its highest northern declination in Gemini and summer will begin in the northern hemisphere.

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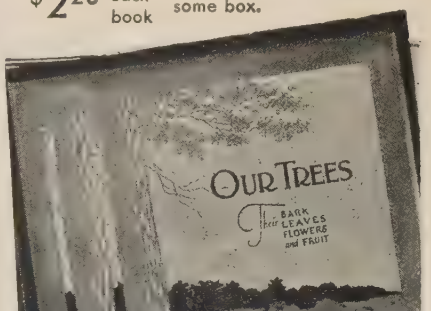

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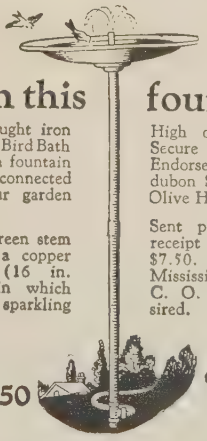

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For Bird Friends

During the warm and dry days of summer there is more satisfaction than many realize in providing a bird bath for the avian neighbors of your home. To look out from your porch on a scorching day and see a bird—even a sparrow—fluttering luxuriantly in the bird bath in the yard often helps one cool off also. With the growth of our cities and suburbs and the consequent elimination of spots where water naturally gathers, it is just plain humanity to provide a combined bathing and drinking supply for bird friends. This can be done so reasonably now, and with such decorative effect as well, that there is little excuse for not providing such mutual enjoyment for birds and oneself.

Birds and Nests

Provision of bird houses is rapidly becoming an essential part of the decoration of one's home grounds. Not only do they mark out those who place them as being friends of the birds, but they provide a fascinating study to all, whether they have any particular knowledge of birds or not.

Birds nest, in some species, as late as June in northern climates. In northern climates the house hunting period runs from April until June and in southern climates about a month earlier. It is, of course, well to have the houses in place fairly early because birds do quite a bit of "shopping around" before they select a cottage to their liking. If you have put off getting a bird house in place, however, better late than never because the housing situation in your locality may be stringent and you will likely play host to late arrivals. Then, too, your bird house will be in place for next year.

Forty-five species of birds are known to have taken up homes in nest boxes or on supporting devices, so there is a wide range of possibilities in the way of tenants. Selection of the bird house should not be, however, haphazard. Thought should be given to the species you are most interested in having, and a box of the proper construction and with the proper size of entrance way should be selected. Also the location of the house is important. Various species are particular about their proximity to a dwelling or other details of location.

The great fun and satisfaction that can be obtained from bird houses around the home will be heightened by paying attention to the several proved facts about birds and their nesting habits. Let us help you in this respect and send you a copy of "Homes for birds", which costs exactly five cents and will return dividends running up into the thousands of dollars in pure enjoyment.

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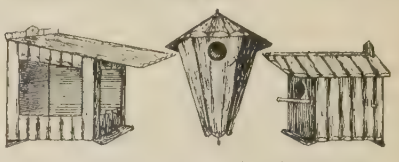

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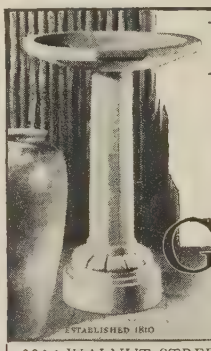

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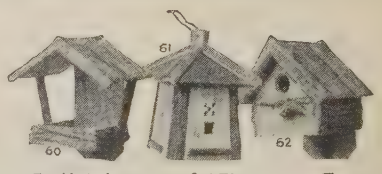

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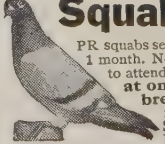

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sparrow from his comfortable home is told by Ruth Grant of Providence, Rhode Island, in whose yard the bird-fight took place. The bluebirds were looking over an unoccupied bird house when the sparrow, who had already taken possession of an adjoining home and begun to raise a family, came over to perch defiantly on the roof as if to say, "not for rent." The bluebird did not waste words—he valiantly pitched in, and the female, a Xantippe in her way, made for the sparrow female, too. The battle ended ingloriously for the sparrow, when, stopping for rest on a fence, he was picked up by the bluebird, carried by the nape of his neck to about a foot above his old house, and then dropped. It was too much, so the sparrow took to his wings, and did not return. Later, Miss Grant found young bluebirds in the house so bravely defended, and the next spring a like number returned to the yard. Perhaps they were the same ones, coming back to the scene of their father's victory.

Talking Crow

The Indian mynah bird in the National Zoological Park that asks, "How about appropriations?" is not so clever compared with a tame crow named "Boll-weevil", owned by the Methodist minister in Weldon, North Carolina. This bird, according to Charles L. Jones, who reports his existence, has in his speech repertoire such phrases as: "You are a nice fellow"; "School is out, let's go home"; "I am a smart boy"; "Go on and don't bother me." He follows the children to school each day and watches for their return in the afternoon, then flies from housetop to housetop as he accompanies them to the door.

Another Bird Book

Of all the phases of natural life, birds are to the majority most interesting. NATURE MAGAZINE has three times the demands for bird articles than for any other type. So even though many excellent bird books are in the field, the new one, *The Book of Bird Life*, by Arthur A. Allen, since it throws a slightly different angle on the study of feathered creatures, most certainly has its niche. This book, replete with photographs and drawings, attempts to lay down general rules that will enable the student to understand his experiences with birds and their singing habits, their courtings, nestings, and relations with each other. The author also deals with the methods of bird study used primarily in the field of living birds—bird walks, bird calendars and bird banding, ways of attracting birds, construction of observation blinds and details of bird photography, the taming of birds and other phases. Most interesting is the chapter on the courtship of birds, but probably most valuable to the student are the pages dealing with their home life. This excellent book is published by D. Van Nostrand Company, New York, at $3.50.

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YOSEMITE TREES SAVED

(Continued from page 367)

Chairman of the sub-committee of the House Committee on Appropriations handling Interior Department funds, who were so far-sighted and patriotic as to inaugurate the policy of appropriating funds to save such natural beauty for posterity. Conservation organizations, outstanding among them the American Nature Association, and the women's clubs of the country also did their share in bringing about this happy result. The Sugar Pine Lumber Company, from which the lands were purchased, conducted the negotiations upon a basis of actual cost of the land, leaving out of consideration any idea of prospective profits. Arthur H. Fleming of Los Angeles, head of the company, and his partner, R. G. Gillis, both have long been active in public welfare work in the State of California, and their action in waiving consideration of future profits is in accordance with their previous public-spirited record.

Oil on Waters

The New York *Times* on January 29 editorially calls attention once more to the deplorable conditions which arise from oil-burners emptying their spent fuel into the ocean near the shores. "Fish and birds along the coasts of many countries are being destroyed," it states, and points out that beaches and resorts are being ruined as well. The international conference held in 1926 at Washington failed to compel the use of separators, but since that time France, then apathetic, has awakened and many British and American ship-owners are cooperating. Public sentiment must take this important and serious matter in hand to prevent further destruction.

Cannibalistic Skunks

An unusual battle in which a skunk fought and killed another skunk and dragged him more than 100 yards to his den is reported by Park Ranger Roy G. Dale of Yellowstone National Park in a recent issue of Yellowstone Park *Nature Notes*. He arrived on the scene shortly after the battle, could discover tracks only of the skunks in the snow, and found the dead skunk and its victor under a rock at the end of the trail, which plainly showed that one of the skunks had been dragged away by the other. This is a most unusual occurrence, as skunks are seldom known to attack one another.

Horses, Horses, Horses

With everyone standing amazed at the number of automobiles gallivanting about the United States, which show a proportion to the population of one to five, few stop to realize that there are 13,440,000 horses in the country, representing a ratio of one to approximately eight. Old dobbin has not been so far out-stripped, after all.

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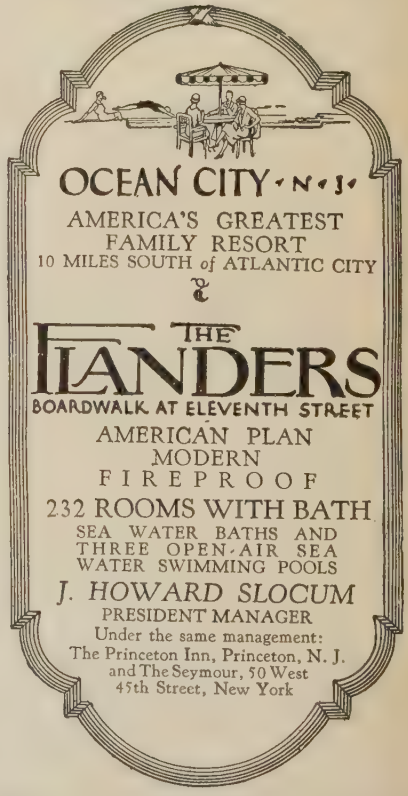

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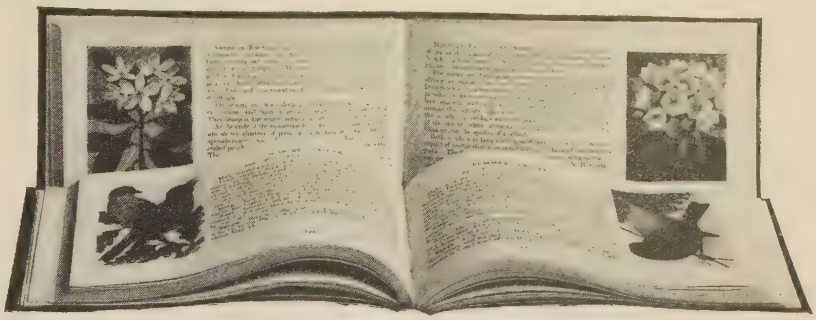

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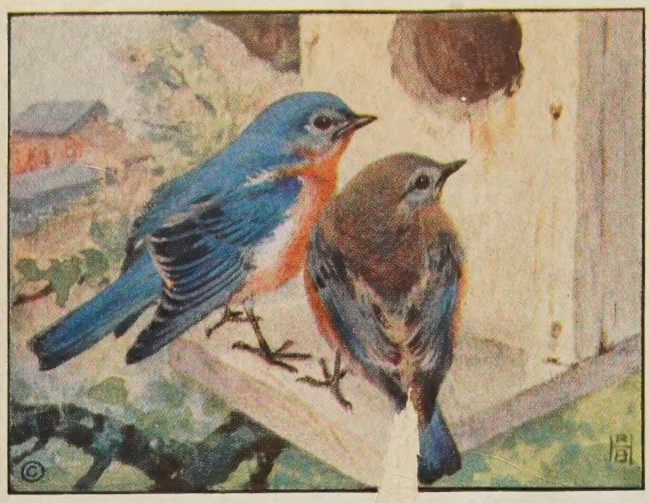

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